Oracle E-Business Suite Release 11i upgrade to R12.1 and platform migration guide: Oracle Sun SPARC-based server to HP ProLiant servers

Technical white paper

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Executive summary

Oracle Applications Release 11i is widely deployed across a broad range of HP server platforms: HP 9000 servers running HP-UX, HP ProLiant servers running Linux or Microsoft® Windows®, and HP AlphaServer systems running Tru64 UNIX®. Customers on those and other vendor platforms, for example, Oracle Sun SPARC-based servers running Solaris, are faced with the impending obsolescence of Oracle Applications Release 11i and/or the operating system hardware combinations on which they are deployed. As Oracle E-Business Suite Release 11i is now in Extended Support until November 2013, the decisions facing these customers relate to how to migrate their Oracle Applications Release 11i environments to a new platform, and whether to upgrade to Oracle E-Business Suite Release 12.1 at the same time.

This document is a guide for Oracle Applications Release 11i customers looking to perform platform migration from Oracle Sun SPARC-based servers running Solaris to HP ProLiant servers running Linux and upgrade their Oracle Applications Release 11i environment to Oracle E-Business Suite Release 12.1. The procedures captured within this document are extracted from various Oracle notes and guides, and includes additional steps required for customers running Oracle Sun SPARC-based servers to complete the migration. This document can also be used as an outline to migrate other vendor platforms to HP ProLiant servers.

The migration to HP ProLiant servers running Linux will be beneficial as you can take advantage of HP’s virtualization capabilities, leadership blade technology, reduce complexity with unified operations and management infrastructure, and improved performance. Flexible mission-critical server blades are now combined with the efficiency of HP BladeSystem to accelerate IT effectiveness. The ability to mix and match HP Integrity, HP ProLiant, and HP Storage blades within the same BladeSystem c-Class enclosure provides flexibility to grow as your business demands change. HP CloudSystem Matrix makes an excellent platform on which to run and grow an E-Business Suite R12.1 environment. CloudSystem Matrix builds upon the HP BladeSystem family to offer an integrated shared services infrastructure platform that uses automation to increase administration efficiency. Changing infrastructure needs for your EBS installation, and indeed your data center as a whole, are more easily handled through the extensive capabilities of the HP CloudSystem Matrix.

HP CloudSystem Matrix is also a fully integrated cloud infrastructure that helps you accelerate business service delivery. You can review and download the available Cloud Maps from HP Cloud Maps download site http://www.hp.com/go/cloudmaps.

The procedures within this document are common amongst Oracle Applications Release 11i environments. However, Oracle Applications is comprised of over 200 business software products, such as Financials, Manufacturing, Human Resources, and so on. Each product will have its own specific upgrade tasks that will not be covered within this document. HP recommends that the local experts study the document Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1 (Oracle Part# E14010-01) in order to determine the proper migration plan for each business software product.

Target audience: The intended audience for this document is IT professionals who deploy and support Oracle E-Business Suite on HP platform. In-depth familiarity with Oracle Database and Oracle E-Business Suite is required.

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Introduction

Oracle E-Business Suite (EBS) is Oracle’s original Enterprise Resource Planning (ERP) application and incorporates over 200 product-specific business applications. ERP, in this case, is a term referring to a set of applications connected by a single database (DB) that serves some or all of the business processes within an organization. Oracle E-Business Suite includes an application tier that contains all the business logic for the various business processes and a database tier that stores all the business-critical data.

E-Business Suite deployments generally require a unique plan for each environment to successfully migrate the data, application customizations, and product-specific functionality to the target platform. This document does not cover the procedures for patching, migrating customizations, performing product-specific tasks, functional testing, add-on software, or other languages support. The focus is strictly platform migration and the upgrade of the Oracle E-Business Suite technology stack.

Note:
Oracle Applications Release 11i customization coding uses Developer 6i Forms & Reports and OA Framework (BC4j Java Container) using JDeveloper9i/10g. Most of the core functionality in Release 11i utilized Developer 6i Forms & Reports. However, E-Business Suite Release 12.1 uses Developer 10g Forms & Reports and OA Framework (OC4J Java Container). Also, a lot of core functionality in Release 12.1 has been moved from Forms & Reports to OA Framework web pages, which means a functional flow which used to be executed in Forms in Release 11i now utilizes OA Framework web pages for the same in Release 12.1.

Due to the aforementioned technology stack differences in Oracle E-Business Suite Release 11i and 12.1, it is not possible to automatically upgrade Release 11i customization to the new Release 12.1. Developers may need to recompile Forms & Reports customization and rebuilt OA Framework extension while migrating to Release 12.1. There are Oracle notes to help in doing the same, for example:

- 987516.1 Planning Your Oracle E-Business Suite Upgrade from Release 11i to Release 12.1
- 1327399.1 EBS ATG Seed Data Comparison Report
- 374398.1 Preparing Custom Development for Next Oracle E-Business Suite Release
- 444248.1 Using the OracleAS 10.1.2 Forms and Reports Builders with Oracle Applications Release 12
- 1306563.1 Extending Oracle E-Business Suite Release 12 using Oracle Application Express (APEX)
- 726711.1 Mod_plsql and Oracle E-Business Suite Release 12
- 563258.1 How to Upgrade 11i Custom Forms to R12
- 451934.1 Accessing Custom Forms After Upgrading From To R12
- 780989.1 R12: Upgrade vs. Reimplementation (Financials)
- 1292611.1 Upgrading Form Personalizations and OA Framework Personalizations from Oracle E-Business Suite Release 11i to 12.1
- Part Number B15572-01 Oracle Forms: Migrating Forms Applications From Forms 6i to 10g (10.1.2.0.2) for Windows and UNIX

In a technological white paper like this, it is not possible to cover the customization and extensions as it varies from customer to customer.
Depending on the release of Oracle Applications 11i, the platform migration and application upgrade may require a preliminary phase. The preliminary phase consists of upgrading to the recommended 11.5.10.2 release. This phase is required for all Oracle Applications 11i environments running 11.5.8 and earlier. Customers running Oracle Applications Release 11.5.9 (base, CU1) and 11.5.10 (base, CU1) are not required to upgrade to 11.5.10.2 release if they are willing to perform all the platform migration and application upgrade phases in a single downtime window. Only Oracle Applications 11.5.9 (CU2) and 11.5.10 (CU2) versions support the split-configuration deployment that allows for pausing between the phases described in this document.

For this particular project, the source configuration used Oracle Applications 11i Release 11.5.10 (CU2), which did not require a preliminary phase. At the end of each phase of the migration the E-Business Suite environment will be in a fully supported configuration. This migration strategy allows for the migration to be paused between phases in order to resume normal operation until continuing onto the next phase.

**Phase 1: Upgrading the source RDBMS to 11gR2**

Phase 1 consists of upgrading the source Oracle Applications 11i database instance to 11gR2 (Version 11.2.0.2). Customers who have already upgraded to RDBMS 10.2.0.3 or above may skip this phase and move on to Phase 2.

**Note**

Oracle RDBMS 11gR2 Patch set 11.2.0.1 is now supported with Oracle E-Business Suite Release 11/12.1 on Oracle Sun SPARC-based servers running Solaris and HP ProLiant servers running Linux. Premier Support for 10gR2 Database officially ended in July 2010. For that reason, HP recommends upgrading to 11gR2 as part of the EBS migration process.

**Phase 2: Migrate Oracle Applications Release 11i/database**

Oracle E-Business Suite Release 12.1 is certified on several platforms including HP ProLiant servers running Linux for both application and database tiers. HP Integrity and ProLiant servers running Windows are fully certified as the database-only platform for both Oracle Applications Release 11i and Oracle E-Business Suite Release 12.1 (known as “Split Configuration Database Tier” in Release 11i and “Mixed Platform Architecture” in Release 12.1). Oracle Split configuration database tier also supports Linux, Microsoft Windows, Tru64 UNIX, Oracle Sun Solaris on SPARC, or IBM AIX as the application tier platform and most of the RDBMS supported platforms. Please see “Certification matrix for HP servers deploying Oracle E-Business Suite applications” for details on certified mixed platform architectures.

For the latest information on supported Oracle Applications 11i Split Configuration database tier, review the “Certifications” page on the Oracle Support Portal website. Also review Oracle Support Portal document: Using Oracle EBS with a Split Configuration Database Tier on 11gR2 [ID 946413.1] and Using Oracle Applications with a Split Configuration Database Tier on Oracle 10g Release 2 [ID 369693.1].

Phase 2 consists of creating a split configuration database tier in Oracle Applications Release 11i by performing a platform migration of the source Oracle Applications Release 11i database instance from the Oracle Sun SPARC-based server running Solaris to the HP ProLiant servers running Linux. At the end of this phase, the Oracle Applications 11i environment will be in a fully supported split configuration where the Oracle Applications 11i application tier components are running on the Oracle Sun SPARC-based server and the database tier components are running on the HP ProLiant server.

As Linux (little endian) and Solaris UNIX (big endian) uses different endian, this document explains and uses the Oracle DataPump export and import tools (expdp/impdp) for the database migration as explained in Oracle Support Portal document: Export/import notes on Applications 11i Database 11g [ID 557738.1]. You can also use Transportable Tablespaces (XTTS) as explained in Oracle Support Portal document: Using Transportable Tablespaces for EBS 11i Using Database 11gR2 [ID 1366265.1] to migrate the database from Solaris UNIX to Linux. You can review the white paper for HP AlphaServer systems to Integrity server migration guide to review the XTTS migration steps.
Phase 3: Upgrade Oracle E-Business Suite to Release 12.1.1


At this stage, you can continue to use Release 12.1.1 with RDBMS 11gR2.

You can optionally upgrade to Oracle E-Business Suite Release 12.1.3.

At the end of each phase, the E-Business Suite environment will be in a fully supported configuration. This migration strategy allows customers to pause the migration/upgrade process between phases in order to resume normal operation and minimize disruption of the business processes.

Recommended test platform and backup strategies

Each phase will require some downtime. The length of downtime will depend on the system configuration and database size. Plan the testing of all phases using a suitable test environment to get a fair estimate of downtimes required for each phase. Such testing should use a recent clone with the same patch level as the production environment to yield an accurate estimate of downtimes. The test executions also provide the opportunity to document any additional steps or patches required for each phase of your migration/upgrade.

It is strongly recommended to perform a complete backup of the E-Business Suite environment before and after each phase. These backups will minimize the risk of business disruption by enabling a quick rollback to a working configuration should an unexpected failure occur.

Project test environment

The test environment used to develop this white paper was comprised of one Oracle Sun SPARC-based server running Solaris as the source platform for the Oracle Applications Release 11.5.10.2 environment and one HP ProLiant server running Red Hat Enterprise Linux (RHEL) 5.3 for the target Oracle E-Business Suite Release 12.1 environment. An Oracle E-Business Suite two-node installation was used, consisting of one node for the application tier and the other node for the database tier. Only the base components for E-Business Suite and the Vision Demo database were installed, excluding any Oracle add-on software, third-party products, and foreign languages.
Migration paths

The following figure outlines several different approaches to the migration/upgrade process.

**Figure 1. Migration approach**

**Migration Approach 1**

- **EBS source 11i**
  - EBS 11.5.10.2/ Tech stack
  - Solaris SPARC DB 9.2.0.8 APPS 11/DB

- **Upgrade DB to 11gR2**
  - EBS 11.5.10.2/ Tech stack
  - Solaris SPARC DB 11gR2 APPS 11/DB

- **Upgrade EBS to 12.1.1**
  - EBS 12.1.1 / Tech stack
  - Solaris SPARC DB 11gR2 APPS R12.1 DB

- **Platform Migration**
  - EBS 12.1.1 / Tech stack
  - Linux ProLiant DB 11gR2 APPS R12.1 DB

**Migration Approach 2**

- **EBS source 11i**
  - EBS 11.5.10.2/ Tech stack
  - Solaris SPARC DB 9.2.0.8 APPS 11/DB

- **Upgrade DB to 11gR2**
  - EBS 11.5.10.2/ Tech stack
  - Solaris SPARC DB 11gR2 APPS 11/DB

- **DB platform Migration**
  - EBS 11.5.10.2/ Tech stack
  - Linux ProLiant DB 11gR2 APPS 11/DB

- **Upgrade EBS to 12.1.1**
  - EBS 12.1.1 / Tech stack
  - Linux ProLiant DB 11gR2 APPS R12.1 DB

**Migration Approach 3**

- **EBS source 11i**
  - EBS 11.5.10.2/ Tech stack
  - Solaris SPARC DB 9.2.0.8 APPS 11/DB

- **DB platform Migration**
  - EBS 11.5.10.2/ Tech stack
  - Linux ProLiant DB 9.2.0.8 APPS 11/DB

- **Upgrade DB to 11gR2**
  - EBS 11.5.10.2/ Tech stack
  - Linux ProLiant DB 11gR2 APPS 11/DB

- **Upgrade EBS to 12.1.1**
  - EBS 12.1.1 / Tech stack
  - Linux ProLiant DB 11gR2 APPS R12.1 DB

**Approach 3 first performs the migration of Oracle Applications Release 11i database 9iR2 to the target HP ProLiant server running Linux and then upgrades the 9iR2 database to 11gR2. This approach will allow the newer, faster HP servers to be deployed early in the migration in order to handle most of the heavy lifting during the migration process. But, the disadvantage of this approach is that this approach requires usage of the old Oracle RDBMS 9iR2 export/import utility to migrate the data instead of datapump utilities (expdp/impdp) offered by Oracle RDBMS 11gR2. Datapump offers many advantages compared to traditional export/import (exp/imp). It is significantly faster,**

Green = Linux x86-64 on HP ProLiant server
Blue = Solaris on Oracle Sun SPARC-based server
and it incorporates new features such as restarting from the point of failure and parallel processing. For more information, review Oracle document for Oracle Database Utilities 11g Release 2 (11.2).

Approach 1 provides a path to upgrade to Oracle E-Business Suite Release 12.1.1 on the source platform and then the whole environment migrates to HP ProLiant servers running Linux. The disadvantage of this approach is that it will require two rigorous and expensive functional and technical tests of R12.1, first after the 11i to R12.1 upgrade and second after R12.1 platform migration. This will result in double testing costs to customers during the migration. Also, in Approach 1 you need to execute a complex process of R12.1 middle tier platform migration in addition to the database platform migration.

**Recommended migration path**

Approach 2 in Figure 1 is the recommended migration approach as it provides a path which avoids the disadvantages occurring in both Approach 1 and Approach 3. The following figure outlines the detailed migration/upgrade process.

**Figure 2. Recommended Migration path**
## Conventions

### Table 1. Conventions and meaning

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Software staging area</strong></td>
<td>Generally located on an NFS server consisting of Oracle and HP installation software and patches for the migration.</td>
</tr>
<tr>
<td><strong>Source application tier</strong></td>
<td>Oracle Sun SPARC-based server running Solaris consisting of the Oracle Applications Release 11i home, applications technology stack, and the admin, concurrent processing, forms, report, and web server services.</td>
</tr>
<tr>
<td><strong>Source database tier</strong></td>
<td>Oracle Sun SPARC-based server running Solaris consisting of the RDBMS 9iR2 ORACLE_HOMEs and the Applications 11i Database</td>
</tr>
<tr>
<td><strong>Source ORACLE_HOMEs</strong></td>
<td>&lt;11g_ORACLE_HOME&gt;11gR2 home, &lt;9i_ORACLE_HOME&gt; 9iR2 home Applications iAS home, Applications 8.0.6 home</td>
</tr>
<tr>
<td><strong>Source APPL_TOP</strong></td>
<td>Applications 11i home</td>
</tr>
<tr>
<td><strong>Target application tier</strong></td>
<td>HP ProLiant server running Linux consisting of the E-Business Suite Release 12.1, home, applications technology stack, and the admin, concurrent processing, forms, report, and web server services.</td>
</tr>
<tr>
<td><strong>Target database tier</strong></td>
<td>HP ProLiant server running Linux consisting of the RDBMS 11gR2_ORACLE_HOME and the Applications R12.1 Database</td>
</tr>
<tr>
<td><strong>Target ORACLE_HOMEs</strong></td>
<td>RDBMS 11gR2 home Applications 10.1.3 .4 AS home (Web or Java ORACLE_HOME, Apache 1.3 and OC4J Applications Developer 10.1.2.3 home (Tools, C, or Dev ORACLE_HOME, Forms 10 and Reports 10)</td>
</tr>
<tr>
<td><strong>Target APPL_TOP</strong></td>
<td>E-Business Suite Release 12.1 home</td>
</tr>
<tr>
<td><strong>APPLMGR</strong></td>
<td>User who owns the Applications file systems. Source APPLMGR environment file: &lt;APPL_TOP&gt;/APPS&lt;SID&gt;.&lt;hostname&gt;.env</td>
</tr>
<tr>
<td><strong>ORACLE</strong></td>
<td>User who owns the database file systems. Source ORACLE environment file: &lt;ORACLE_HOME&gt;/&lt;SID&gt;.&lt;hostname&gt;.env</td>
</tr>
<tr>
<td><strong>ORACLE_SID</strong></td>
<td>&lt;SID&gt; Database Site Identifier</td>
</tr>
<tr>
<td><strong>adadmin</strong></td>
<td>Application DBA administration utility</td>
</tr>
<tr>
<td><strong>adpatch</strong></td>
<td>Application DBA patching utility</td>
</tr>
<tr>
<td><strong>adconfig.sh</strong></td>
<td>Application DBA configuration utilities (AutoConfig)</td>
</tr>
<tr>
<td><strong>opatch</strong></td>
<td>RDBMS DBA patching utility</td>
</tr>
<tr>
<td><strong>rapidwiz</strong></td>
<td>Oracle Rapid Install Wizard for E-Business Suite</td>
</tr>
<tr>
<td><strong>runInstaller</strong></td>
<td>Oracle Install Wizard for RDBMS</td>
</tr>
<tr>
<td><strong>Monospace Text</strong></td>
<td>Represents command line text</td>
</tr>
<tr>
<td><strong>&lt; &gt;</strong></td>
<td>Text enclosed in angle brackets represents a variable</td>
</tr>
<tr>
<td><strong>#</strong></td>
<td>Preceding # on a command line text represents ROOT level access</td>
</tr>
<tr>
<td><strong>$</strong></td>
<td>Preceding $ on a command line text represents ORACLE or APPLMGR user access</td>
</tr>
</tbody>
</table>
Prerequisites

Prior to beginning the platform migration the following software versions should be considered the minimum operating version levels.

Table 2. Minimum operating version levels

<table>
<thead>
<tr>
<th>Source software</th>
<th>Minimum version</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solaris</td>
<td>5.10</td>
<td>source DB-Tier</td>
<td>Oracle Sun SPARC-based server running Solaris</td>
</tr>
<tr>
<td></td>
<td></td>
<td>source APPS-Tier</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applications release</th>
<th>Minimum version</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications Release 11.5.10.2</td>
<td>Includes RDBMS 9.R2</td>
<td>source APPS-Tier</td>
<td>Oracle Sun SPARC-based server running Solaris</td>
</tr>
<tr>
<td></td>
<td></td>
<td>source DB-Tier</td>
<td>Oracle Sun SPARC-based server running Solaris</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Database release</th>
<th>Minimum version</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDBMS 9.R2</td>
<td></td>
<td>source DB-Tier</td>
<td>Oracle Sun SPARC-based server running Solaris</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target software</th>
<th>Minimum version</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux x86-64</td>
<td>RHEL 5.3</td>
<td>target DB-Tier</td>
<td>HP ProLiant server</td>
</tr>
<tr>
<td></td>
<td></td>
<td>target APPS-Tier</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applications release</th>
<th>Minimum version</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Business Suite Release 12.1.1</td>
<td>RDBMS 11gR2</td>
<td>target APPS-Tier</td>
<td>HP ProLiant server</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Database release</th>
<th>Minimum version</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDBMS 11gR2</td>
<td></td>
<td>target DB-Tier</td>
<td>HP ProLiant server</td>
</tr>
</tbody>
</table>

Migration project test platform

All the steps recorded in this migration document are specific to this test platform. The migration document was developed using the following configuration.

Source APPS and DB server:
Oracle Sun SPARC-based server
Solaris 10 (5.10)
Oracle E-Business Suite 11.5.10.2
Oracle RDBMS 9.2.0.8
Oracle RDBMS 11gR2

Target APPS and DB server:
HP ProLiant server
RHEL 5.3
Oracle E-Business Suite Release 12.1
Oracle RDBMS 11gR2

The source application and database components for Oracle Applications Release 11.5.10.2 were installed in a single node architecture using the Vision Demo database. A two-node installation consists of the application tier, containing the application file system, technology stack, admin, concurrent processing, forms, report, web server; and the database tier, containing the RDBMS file system and Applications 11i database installed on a single server. The
Vision Demo database is a sample database used to simulate a medium-sized company using some of the more popular E-Business Suite software components.

Oracle RDBMS 11gR2 was also installed on the source DB server in a different ORACLE_HOME for the Applications 11i Vision Demo database 11gR2 upgrade.

The target DB server was installed with Oracle RDBMS 11gR2 and prepared for Applications 11i Vision Demo database platform migration.

The target APPS server was prepared for the installation of E-Business Suite Release 12.1.1 home.

Preliminary phase

Upgrading to Oracle Applications Release 11.5.10.2 or, at a minimum, 11.5.9(CU2) before beginning the migration process is highly recommended in order to take advantage of the phased migration approach.

Customers who need to continue operating the deployment at some intermediate point – for example after the initial database upgrade to 11gR2 – should consider upgrading to 11.5.10.2 before beginning the migration. For more information, refer to Oracle Support Portal document: Oracle Applications Release 11.5.10.2 Maintenance Pack Installation Instructions [ID 316365.1].

Deployments of 11.5.8 and earlier must upgrade to 11.5.10.2 prior to beginning the migration process described in this document. For more information, refer to Upgrading Oracle Applications Release 11i (11.5.10.2), Part Number B19297-01.

The following figure shows the process migration flow.

---

Figure 3. Migration flow

Oracle E-Business Suite Release 12.1 uses Oracle E-Business Suite Tablespace model (OATM), which is based on database object type rather than product affiliation. OATM uses 12 locally managed tablespaces for all products, including the temporary tablespace, system tablespace, and system-managed undo (SMU) tablespace. Release
11.5.9 and 11.5.10 support this tablespace model while earlier releases will need to migrate to this model to take full advantage of the Release 12.1 features. For further details see Oracle Support Portal document: Oracle Applications Tablespace Model Release 11i - Tablespace Migration Utility [ID 248857.1].

**Migration prerequisites**

Oracle E-Business Suite is highly configurable and customizable with many customers deploying their own unique environments. For this reason, HP strongly recommends that all migration tasks described in this document be applied first to a test environment in order to determine application downtime and record any additional steps that may be necessary for proper migration of add-on software’s, languages, and customizations. Most customers will run through the migration process a number of times on their test environments before finally implementing it in the production environment. Also, additional storage and CPU resources may be required during the migration process, to reduce resource bottlenecks and expedite the effort. It is also recommended to perform a full backup of the entire environment before starting and ending each phase of the migration.

The test source platform included Oracle Applications 11.5.10.2, Developer 6i Patch Set 16 and AutoConfig 11i.AD.I.2. If your Oracle E-Business Suite release is not on 11.5.10.2 then upgrade to 11.5.10.2 before beginning the migration as earlier Oracle E-Business Suite releases are not certified with Oracle Database 11gR2 (11.2.0). Review the “Certifications” section at Oracle Support Portal and verify that your Oracle E-Business Suite environment is certified with Oracle RDBMS 11gR2 before migration.

The following application patch list in Table 4 includes the patches required before starting the migration. For more information, refer to Oracle Support Portal document: Interoperability Notes Oracle EBS 11i with Oracle Database 11gR2 (11.2.0.2) [ID 881505.1].

The Applications 11i patches in the following table were applied to the application tier in the order listed. Additional patches may be required for third-party products and other E-Business Suite software modules not included with the base installation. National language support (NLS) will also require additional patches.

---

**Note**

This document was written in November of 2011 and all of the following patches named in this document were available at that time. Always confirm the patch list with the latest Oracle Support Portal documents and follow the patch readme instructions unless otherwise directed.

There may be some advantages to applying a superseded patch or patch set that better supports your current environment. Oftentimes, a superseded patch or patch set will contain many other patches, which may produce unexpected results. Pay close attention to possible dependent patches and note any additional steps not covered in this guide.
Table 4. Application patches

<table>
<thead>
<tr>
<th>Application patches</th>
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<tr>
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<td>Dependent patch</td>
<td>4653225</td>
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</tr>
</tbody>
</table>

**Note:** The latest Applications DBA Minipack 11i.AD.I.7 and TXK Rollup Patch include dependent patches listed in the readme notes for the 11gR2 Interoperability patch.

| Interoperability patch    | 8815204      | INTEROPERABILITY PATCH FOR R11I ON 11.2 RDBMS                          |

Before starting the migration, record any invalid objects in the 9iR2 database. Re-check the database for invalid objects before and after each phase or milestone.

Logon as the owner of the 9i database instance and source the environment file.

Connect to the 9i database with SYSDBA privileges to check for any invalid objects. If any invalid objects are found, use ADADMIN to remove as many as possible before continuing.

```
$ sqlplus '/ as sysdba'
SQL> SELECT count(*) FROM dba_objects WHERE status='INVALID';
SQL> SELECT owner,object_name,object_type FROM dba_objects WHERE status='INVALID';
```

**Note**

You can expect some additional invalid database objects to be generated during the migration process, although it is possible that the steps conducted during the migration may repair or otherwise eliminate some object corruption.
Phase 1: Upgrading the source RDBMS to 11gR2

The source environment consists of an Oracle Sun SPARC-based server running Solaris with Oracle Applications Release 11.5.10.2 and the Vision Demo database instance based on Oracle RDBMS 9.2.0.8. Phase 1 will upgrade the database instance to Oracle RDBMS 11gR2 by first installing a new 11gR2 ORACLE_HOME, and then upgrading the Applications 11i database instance using the Database Upgrade Assistant (DBUA). If you are using or will use 11g Real Application Clusters (RAC) or Automatic Storage Management (ASM) in your target environment then use Oracle Support Portal document: Using Oracle 11g Release 2 Real Application Clusters with Oracle E-Business Suite Release 11i [ID 823586.1]. Before proceeding, determine if your particular environment requires any additional steps by thoroughly reading Oracle Database Quick Installation Guide 11g Release 2 (11.2) for Oracle Solaris on SPARC (64-Bit) Part Number E17755-05, Oracle Database Installation Guide 11g Release 2 (11.2) for Oracle Solaris Part Number E17163-06 and Oracle Support Document: Oracle Applications Release 11i with Oracle 10g Release 2 (10.2.0) [ID 362203.1].

Note
Oracle Applications Release 11i now supports Oracle RDBMS 11.2.0.2 for Oracle Sun SPARC-based servers running Solaris 10. Upgrading now to 11.2.0.2 will reduce the need to upgrade at a later date.

Oracle Database release 10.2.0.3 is the minimum RDBMS release supported by Oracle E-Business Suite Release 12.1.1. An upgrade of Oracle Applications Release 11i to Oracle E-Business Suite Release 12.1.1 with database versions from 10.2.0.3 to 11.2.0.2 is currently supported.

If your company has already upgraded the Applications 11i database to 10gR2 10.2.0.3 or later and you do not want to upgrade to 10.2.0.4 during migration, then you can proceed directly to Phase 2: Migrating Oracle Applications 11i database to HP ProLiant Linux x86-64 server.

During this upgrade phase of the migration, you will:

- Section 1: Prepare the source database server for 11gR2 upgrade
- Section 2: Install RDBMS 11gR2 on source database server
- Section 3: Upgrade Applications 11i database to 11gR2 on source database server

Section 2 does not depend on section 1 and can be performed first or simultaneously.

Once all the tasks have been completed in phase 1, the E-Business Suite 11i environment will be in a fully supported mode with the upgraded 11gR2 database. At this time, the migration can be paused to resume normal operations or if time permits, continue on with Phase 2: Migrating Oracle Applications 11i database to HP ProLiant Linux x86-64 server. Make sure that you have upgraded to Oracle RDBMS 9iR2 version 9.2.0.8 as the minimum version required.
to upgrade to 11.2.0.X.X is 9.2.0.8.0. Upgrade the RDBMS 9iR2 to 9.2.0.8 using “Section 2: Upgrading an Existing Oracle9i Release 2 (9.2.0) Database” of the Oracle Support Document: Oracle Applications Release 11i with Oracle9i Release 2 (9.2.0) [ID 216550.1]. Make sure that the “CATPATCH.SQL” script completes successfully and all the required components have been upgraded to 9.2.0.8 successfully as shown in the following figure:

Figure 5. Upgrade to Patchset 9.2.0.8
Direct upgrade to the new Oracle Database 11g release is supported from 9.2.0.8 or higher, 10.1.0.5 or higher, 10.2.0.2 or higher, and 11.1.0.6 or higher. Hence, you will not be able to upgrade if the RDBMS is on an earlier version 9iR2 and the DBUA utility will fail with error as shown in following figure:

**Figure 6. Upgrade error**


### 1.1 Prepare the source database server for 11gR2 upgrade

This section includes the tasks to prepare the source database server for the upgrade to RDBMS 11gR2.

Download the Oracle RDBMS 11gR2 (Version 11.2.0.2) installation media for Oracle Sun server running Oracle Solaris from Oracle Support Portal delivered by Patch 10098816: 11.2.0.2.0 Patch set for Oracle Database Server. This patch delivers the full installation media and you do not need to download and install 11.2.0.1.

Starting with the first patch set for Oracle Database 11gR2 (11.2.0.2), Oracle Database patch sets are full installations of the Oracle Database software.
This patch delivers all the required components for 11gR2 as shown in following figure:

For more information about the changes, refer to Oracle Support Portal document: Important Changes to Oracle Database Patch Sets Starting With 11.2.0.2 [ID 1189783.1].
The following steps were derived from Oracle Support Document: Interoperability Notes Oracle EBS 11i with Oracle Database 11gR2 (11.2.0.2) [ID 881505.1] along with some additional steps to complete the upgrade.

1.1 Backup the Oracle Applications 11i environment
For rollback purposes, shutdown the Oracle Applications 11i environment and take a full cold backup of both the application tier and database tier.

1.1.1 Oracle Portal 3.0.9 check (conditional)
If you are using and planning to continue to use Oracle Portal 3.0.9 in your current Oracle Applications 11i environment, then the existing Oracle Portal functionality must be migrated to Oracle Portal 10g to ensure compatibility with Oracle Database 11gR2. Review the Oracle Support Portal document: Installing Oracle Application Server 10g with Oracle E-Business Suite Release 11i [ID 233436.1]. Oracle Portal 3.0.9 should be removed only after the installation of Oracle Portal 10g.

If you are not planning to use Oracle Portal 3.0.9 in the future then you can remove Oracle Portal 3.0.9 and any dependencies from Oracle Applications 11i by performing the steps in the Oracle Support Portal document: Remove Oracle Portal 3.0.9 from E-Business Suite 11i [ID 312349.1].

1.1.3 Deregister the existing database server (conditional)
If you are planning to use a new database port, host, SID, or database name parameters on the database server, then you must also update AutoConfig setup on the database tier and deregister the existing database server node.

1.2 Install RDBMS 11gR2 on the source database server
This section includes the steps to install the software-only version of the Oracle RDBMS 11gR2 on the source Oracle Sun SPARC-based server running Solaris.

1.2.1 Preparation to create the 11.2.0.2 Oracle home
To understand the installation and upgrade processes, read Chapters 1 and 2 of the Oracle Database Installation Guide 11g Release 2 (11.2) for Oracle Solaris Part Number E24346-01 and the "System Considerations and Requirements" section of Chapter 3 of the Oracle Database Upgrade Guide 11g Release 2 (11.2) Part Number E23633-02. Execute any additional steps that are relevant for your environment.

1.2.2 Install the 11.2.0.2 software
Start up an Xterm session on the source database server as the “oracle” user, change directory to the 11.2.0.2 installation media staging area, and run the Oracle Universal Installer (OUI).

DO NOT source the 9i database environment file.

```
$ cd <11.2.0.2_staging_directory>
$ ./runInstaller
Select Installation Type
   Enterprise Edition
Specify Home Details
   Name: OUIHome2
   Path: <11gR2_ORACLE_HOME>
Product-specific prerequisite checks
   The warning status for the OS and kernel patches can be ignored if running the prescribed software releases and kernel settings.
   Many of the required patches, as well as some kernel settings, have been superseded or discontinued.
Upgrade an Existing Database
   NO
Select Configuration Option
   Install database software only
```
Execute Configuration scripts Popup
As root user run the following script:
# <11gR2_ORACLE_HOME>/root.sh

End of Installation

1.2.3 Install Oracle Database 11g products from the 11gR2 example CD
Review the tasks in section 3.5, of Installing Oracle Database 11g Products in the Oracle Database Example CD Installation Guide Part # E10402-02 for your platform. Do not perform the tasks in the Preparing Oracle Workflow Server for the Oracle Workflow Middle Tier Installation section.

Start up an Xterm session on the source database server as the “oracle” user; change directory to the 11gR2 Example CD staging area and run the Oracle Universal Installer.

Make sure that:

- The ORACLE_HOME environment variable points to the new 11.2.0 Oracle home.
- The PATH environment variable includes $ORACLE_HOME/bin and the directory where the new Perl executable is located (usually $ORACLE_HOME/perl/bin).
- The LD_LIBRARY_PATH environment variable includes $ORACLE_HOME/lib.
- The PERL5LIB environment variable points to the directories where the new Perl libraries are located (usually $ORACLE_HOME/perl/lib/5.10.0 and $ORACLE_HOME/perl/lib/site_perl/5.10.0).

```
$ export ORACLE_HOME=/oracle/<sid>db/11.2.0
$ export PATH=$ORACLE_HOME/bin:$ORACLE_HOME/perl/bin:$PATH:
$ export LD_LIBRARY_PATH=$ORACLE_HOME/lib
$ export PERL5LIB=$ORACLE_HOME/perl/lib/5.10.0
  $ORACLE_HOME/perl/lib/site_perl/5.10.0
$ cd <11.2.0 Example CD staging_directory>
$ ./runInstaller
```

This patch delivers all the required components for 11gR2.

1.2.4 Create nls/data/9idata directory
As the owner of the 11gR2 RDBMS file system, set the ORACLE_HOME variable and run the cr9idata.pl Perl script; then set the ORA_NLS10 environment variable.

```
$ export ORACLE_HOME=<11gR2_ORACLE_HOME>
$ export PATH=$ORACLE_HOME/bin:$ORACLE_HOME/perl/bin:$PATH:
$ export LD_LIBRARY_PATH=$ORACLE_HOME/lib
$ export PERL5LIB=$ORACLE_HOME/perl/lib/5.10.0
  $ORACLE_HOME/perl/lib/site_perl/5.10.0
$ cd $ORACLE_HOME/nls/data/old
$ perl cr9idata.pl
$ export ORA_NLS10=$ORACLE_HOME/nls/data/11gR2data
```

After creating the directory, make sure that the ORA_NLS10 environment variable is set to the full path of the 9idata directory whenever you enable the 11gR2 Oracle home.

1.2.5 Apply additional 11.2.0 RDBMS patches
Shutdown the applications server services, database, and listener before applying the following platform specific RDBMS one-off patches. Also apply OPatch 11.2.0.0.0 (Patch 6880880) for Oracle Solaris on SPARC (64-bit) (or the latest OPatch version for 11gR2) before applying these additional RDBMS patches.

```
10149223 Oracle Solaris on SPARC (64-bit)
10229719 Oracle Solaris on SPARC (64-bit)
```

Run opatch lsinventory before and after applying patches. Review all the readme files before applying any patch and review the logs for any discrepancy after applying each patch. If any are found, resolve them first before continuing to the next step.
1.2.6 Install the latest available critical patch update and any required patches

Once you have installed the major Oracle Database 11g software, check to see if there is a critical patch update that needs to be installed. The latest critical patch update for Oracle Database 10g Release 2 should be installed prior to upgrading your databases. Refer to the specific critical patch update documentation for installation information.

1.3 Upgrade Applications database to 11gR2

This section includes the tasks to upgrade the Oracle Applications Release 11i applications database from 9.2.0.8 to 11gR2. During this process, the environment will be unavailable until the upgrade has completed.

1.3.1 Preparation before Applications database upgrade

Review Chapter 2 of Oracle Database Upgrade Guide 11g Release 2 (11.2) Part Number E23633-02 and Oracle Support Document: Interoperability Notes Oracle EBS 11i with Oracle Database 11gR2 (11.2.0.2) [ID 881505.1], to prepare for the upgrade.

Make sure that you unset the TNS_ADMIN environment variable and if event="38004 trace name context forever, level 1" is defined in either the init<SID>.ora initialization parameter file or the spfile<SID>.ora server parameter file, remove it.

1.3.2 Shut down the applications server processes and the database listener

Shut down applications server processes and the database listener

```bash
# su - applmgr
$ cd $COMMON_TOP/admin/scripts/<SID>_<HOSTNAME>
$ ./adstpall.sh apps/<apps_password>
```

Shut down database listener on the database node.

```bash
# su - oracle
$ lsnrctl stop <SID>
```

1.3.3 Prepare for upgrading the database instance

The following steps were derived from the Oracle Database Upgrade Guide 11g Release 2 (11.2) Part Number E23633-02, Chapters 3 and 4.

- Oracle recommends that you use 500MB as the SYSAUX tablespace size and set autoextend on the SYSAUX tablespace.
- When upgrading all statistics tables, note that Oracle Applications has only one statistics table, APPLSYS.FND_STATTAB that needs to be upgraded.
- If you plan to change the PL/SQL compilation mode, disable the compilation of objects.
- Verify that the /etc/oratab file has correct entries for the 9i Database and 9i Oracle Home.

```bash
# cat /etc/oratab
<SID>:<9i_ORACLE_HOME>:N:
```

Run the pre-upgrade information tool using the following steps:

- Logon as the owner of the 9i_RDBMS file system and source the environment.
- Copy and run the utlu112i.sql from <upg_11202_log_directory>.

```bash
$ cp <11gR2_ORACLE_HOME>/rdbms/admin/utlu112i.sql <upg_11202_log_directory>
```

- Execute the utlu112i.sql by connecting to 9i Database using SQL*Plus with SYSDBA privileges. Spool the output of this execution into utlu112i.out.

```bash
$ cd <upg_11202_log_directory>
$ sqlplus '/ as sysdba'
SQL> spool utlu112i.out
SQL> @utlu112i.sql
SQL> spool off
```
• Review the output for any errors or warnings and make any necessary changes before proceeding on to the next step. For further details, see Oracle Support Document: How to Download and Run Oracle's Database Pre-Upgrade Utility [ID 884522.1].

1.3.4 Upgrade the Applications 11i/database

Make sure that the Applications server processes and the 9i database listener are shut down. Set the environment variable ORACLE_HOME to point to the 11gR2_ORACLE_HOME directory created in the step “1.1 Prepare the source database server for 11gR2 upgrade” and run the Oracle Database Upgrade Assistant (DBUA) against the Applications 11i database.

Read Chapter 2 of Oracle Database Upgrade Guide 11g Release 2 (11.2) Part Number E23633-02. Take note of the section pertaining to the Database Upgrade Assistant (DBUA).

Start an Xterm session on the source database server as the “oracle” user, export the new ORACLE_HOME, and run the DBUA from $ORACLE_HOME/bin.

```
$ export ORACLE_HOME=<11gR2_ORACLE_HOME>
$ cd $ORACLE_HOME/bin
$ ./dbua
```

Select the 9i database from the list of available databases.

Monitor the progress of the DBUA. At the end of the upgrade process, DBUA will automatically start the instance.

The upgrade log files are located in $<11gR2_ORACLE_HOME>/cfgtoollogs/dbua/<SID>/upgrade.

Review “UpgradeResults.html” and make any necessary changes.

1.3.5 Edit the initialization parameter file

The newly installed Oracle 11gR2 will not be tuned for Oracle Applications 11i. Review the Oracle Support Portal document: 216205.1 Database Initialization Parameters and Configuration for Oracle Applications Release 11i.

---

**Note**

During the database startup, Oracle DB 11g first looks in $ORACLE_HOME/dbs for the spfile (spfile<SID>.ora) and if not found the RDBMS will attempt to load the pfile (init<SID>.ora) file. After the 11gR2 upgrade, both pfile and spfile have the same values. It will be easier to modify the pfile and then recreate the spfile after all the changes are made and the database started. Make sure that you rename the spfile<SID>.ora and backup the init<SID>.ora before modifying.

---

Make the following modification and restart the database.

**Common EBS 11i modifications**

```
  db_file_multiblock_read_count = 8
  optimizer_max_permutations = 2000
  query_rewrite_enabled = true
  _sort_elimination_cost_ratio = 5
  _like_with_bind_as_equality = TRUE
  _fast_full_scan_enabled = FALSE
  _sqlexec_progression_cost = 2147483647
```

**11gR2 EBS 11i modifications**

```
  _b_tree_bitmap_plans = FALSE
  optimizer_secure_view_merging = FALSE
  _optimizer_autostats_job=false
  compatible = 10.2.0
  session_cached_cursors = 500
  sga_target = 1G
  shared_pool_reservered_size=40M
  shared_pool_size=400M
```
11gR2 EBS 11i removed parameters

_kks_use_mutex_pin=FALSE
background_dump_dest
core_dump_dest
db_block_buffers
db_file_multiblock_read_count
db_cache_size
java_pool_size
large_pool_size
query_rewrite_enabled
undo_retention

1.3.6 Additional database modification
System Managed Undo (SMU) should be enabled in the database instance and define the temporary tablespace properly. Review My Oracle Support Portal document: 216205.1 Database Initialization Parameters and Configuration for Oracle Applications Release 11i and follow the instructions in these sections:

- Release-specific database initialization parameters for 11gR2
- Enabling System Managed Undo (SMU)
- Temporary Tablespace Setup

1.3.7 Perform 11.2.0.2 patch set post-installation tasks
Review the “Postinstallation Tasks” section of the 11.2.0.2 patch set notes (README.html). After you install the patch set, you must perform the post-installation tasks. Skip the sections “Upgrading Earlier Oracle Database to Oracle Database 11g Release 2 (11.2.0.2)”, “Enabling Oracle Database Vault”, and “Upgrading Oracle Database 11g Release 11.2.0.x to Oracle Database 10g Release 10.2.0.2” of the patch set notes.

Bounce the database and run the SQL script to validate invalid objects within the database.

SQL> shutdown
SQL> startup
SQL> @/?/rdbms/admin/utlrp.sql

Use the following queries to track recompilation progress:

Query returning the number of invalid objects remaining. This number should decrease with time.

SQL> SELECT COUNT(*) FROM obj$ WHERE status IN (4, 5, 6);

Query returning the number of objects compiled so far. This number should increase with time.

SQL> SELECT COUNT(*) FROM UTL_RECOMP_COMPILED;

1.3.8 Install Oracle Data Mining and OLAP

Note
Restricted use licenses for Oracle Data Mining and OLAP are included with Oracle Database Enterprise Edition for the purposes of upgrading existing E-Business Suite databases.

Cross check that Oracle Data Mining and OLAP are installed in your database. Connect to the database as SYSDBA and run the following command:

SQL> connect / as sysdba;
SQL> select comp_id from dba_registry where comp_id='ODM' or comp_id='AMD';

If the query does not return ODM, then your database does not have Oracle Data Mining installed. To install Data Mining, connect to the database as SYSDBA and run the following command:

SQL> connect / as sysdba;
SQL> @$ORACLE_HOME/rdbms/admin/dminst.sql SYSAUX TEMP
If the query does not return AMD, then your database does not have OLAP installed. To install OLAP, connect to the database as SYSDBA and run the following command:

```sql
SQL> connect / as sysdba;
SQL> @$ORACLE_HOME/olap/admin/olap.sql SYSAUX TEMP
```

### 1.3.9 Natively compile PL/SQL code (optional)

You can choose to run Oracle Applications Release 11i PL/SQL database objects in natively compiled mode with Oracle Database 11g. For detailed steps, refer to the *Compiling PL/SQL Code for Native Execution* section of Chapter 11 of Oracle Database PL/SQL User’s Guide and Reference 11g Release 2 (11.2).

When modifying the initialization parameters pertaining to the PL/SQL native compilation, refer to Oracle Support Portal document: 216205.1, *Database Initialization Parameters and Configuration for Oracle Applications Release 11i* as a guideline. You can set the `plsql_native_library_subdir_count` parameter as described in the PL/SQL user’s guide. Create the associated subdirectories for the given `plsql_native_library_dir` and `plsql_native_library_subdir_count` parameters.

### 1.3.10 Fix Korean lexers

If you have upgraded from 10.1.0 or previous releases, then connect to the database as SYSDBA, and run drkorean.sql using the following command:

```bash
$ sqlplus "/ as sysdba" @$ORACLE_HOME/ctx/sample/script/drkorean.sql
```

### 1.3.11 Start the new database listener

Since AutoConfig has not yet been implemented, start the listener with the lsnrctl executable. See the Oracle Database Net Services Administrator’s Guide, 11g Release 2 (11.2) for more information.

Prior to starting the listener, perform these additional steps:

Create the `$TNS_ADMIN` directory in the 11g ORACLE_HOME.

```bash
$ export ORACLE_HOME=<11g_ORACLE_HOME>
$ export ORACLE_SID=<SID>
$ export PATH=$ORACLE_HOME/bin:$PATH:.
$ export ORA_NLS10=$ORACLE_HOME/nls/data/9idata
$ mkdir -p $ORACLE_HOME/network/admin/<SID>_<hostname>
$ export TNS_ADMIN=$ORACLE_HOME/network/admin/<SID>_<hostname>

Copy the contents of 9i_TNS_ADMIN to `$TNS_ADMIN`.

```bash
$ cp <9i_Oracle_Home>/network/admin/<SID>_<hostname>/* $TNS_ADMIN
```

Modify the following .ora files changing all directory reference of 9.2.0 to 11.2.0.

```bash
$ vi $TNS_ADMIN/listener.ora
$ vi $TNS_ADMIN/sqlnet.ora
$ vi $TNS_ADMIN/tnsnames.ora
```

Start the new Oracle Net Listener.

```bash
$ lsnrctl start <SID>
```

### 1.3.12 Run adgrants.sql

Copy `$APPL_TOP/admin/adgrants.sql` from the administration server node to the database server node. Use SQL*Plus to connect to the database as SYSDBA and run the script using the following command:

```bash
$ sqlplus "/ as sysdba" @adgrants.sql <APPLSYS schema name>
```

where `<APPLSYS schema name>` is the Applications Object Library user, most commonly named APPLSYS.
1.3.13 Grant create procedure privilege on CTXSYS

Copy $AD_TOP/patch/115/sql/adctxprv.sql from the administration server node to the database server node. Use SQL*Plus to connect to the database as APPS and run the script using the following command:

```
$ cd $ORACLE_HOME/admin
$ sqlplus apps/<apps_password>
SQL> @adctxprv.sql <SYSTEM password> CTXSYS
```

1.3.14 Implementing AutoConfig on upgraded database

You need to configure and run AutoConfig in the new Oracle home on the database server node. If you have a different configuration for the database listener in the new Oracle home, then you must also run AutoConfig on each application tier server node to update the system with the new listener.


Shut down all processes, including the database and the listener, and restart them to load the new environment settings.

This task will migrate AutoConfig to the DB Tier.

Logon to the Application node, source the environment file, then run the admkappsutil.pl script. This Perl script will create the appsutil.zip file located in the $APPL_TOP/admin/out directory.

If current, you can also use the appsutil.zip located in the 9i_ORACLE_HOME.

```
$ perl $AD_TOP/bin/admkappsutil.pl
```

Copy and unzip the appsutil.zip file in the Database node <11gR2_ORACLE_HOME>.

```
$ cd <11gR2_ORACLE_HOME>
$ unzip -o appsutil.zip
```

Set the following environment variables to be incorporated in the database context file.

```
# su - oracle
$ export ORACLE_SID=<SID>
$ export ORACLE_HOME=<11gR2_ORACLE_HOME>
$ export PATH=$ORACLE_HOME/bin:$PATH:
$ export TNS_ADMIN=$ORACLE_HOME/network/admin/<SID>_<hostname>
$ export ORA_NLS10=$ORACLE_HOME/nls/data/9idata
$ export JRE_TOP=$ORACLE_HOME/jre/1.4.2
$ export LD_LIBRARY_PATH=$ORACLE_HOME/lib32
$ export SHLIB_PATH=$ORACLE_HOME/lib32
$ export LIBPATH=$ORACLE_HOME/lib32
```

Generate the database context file.

```
$ cd $ORACLE_HOME/appsutil/bin
$ perl adbldxml.pl tier=db appsuser=apps appspasswd=<apps_password>
```

The newly-created context file and log file are located in following locations:

Context File = <11gR2_ORACLE_HOME>/appsutil/<SID>_<hostname>.xml
Log file = <11gR2_ORACLE_HOME>/appsutil/log/adbldxml_<date>.log

Modify the context file, changing all reference of 9.2.0 to 11.2.0.

---

**Note**
An improper entry introduced into the context file can render the applications environment inoperable. Always make a backup prior to editing the context file.
Run AutoConfig to generate a new 11gR2 environment file located in the `<11_g_ORACLE_HOME>` directory.

```bash
$ cd $ORACLE_HOME/appsutil/bin
$ ./adconfig.sh \
  contextfile=<11gR2_ORACLE_HOME>/appsutil/<SID>_<hostname>.xml \
  appspass=<apps_password>
```

Review the log file for any failures, errors, or warnings and resolve those issues before continuing.

Shut down the 11g database and listener, source the new database environment file, and then start up the listener and the 11g database.

```bash
$ sqlplus / as sysdba
SQL> shutdown normal
SQL> exit
$ lsnrctl stop <SID>

# su - oracle
$ . <11gR2_ORACLE_HOME>/<SID>_<hostname>.env
$ lsnrctl start <SID>
$ sqlplus / as sysdba
SQL> startup
```

**1.3.15 Gather statistics for SYS schema**

Copy `$APPL_TOP/admin/adstats.sql` from the administration server node to the database server node. SQL script `adstats.sql` requires the database to be running in restricted mode. Connect to the database as SYSDBA and use the following commands to restart the database in restricted mode, run `adstats.sql`, and restart the database in normal mode:

```bash
$ sqlplus / as sysdba
SQL> shutdown normal
SQL> startup restrict
SQL> @?/admin/adstats.sql
SQL> shutdown normal
SQL> startup
```

There should be at least 1.5 GB of free default temporary tablespace.

**1.3.16 Re-create custom database links (conditional)**

If you have different configuration for the database listener in the new Oracle home, then you must re-create any custom self-referential database links that exist in the Applications database instance. Verify the existing database links. Connect to the Applications database instance as APPS and run the following query:

```bash
$ sqlplus apps/<apps password>
SQL> select db_link from dba_db_links;
```

If EDW_APPS_TO_WH and APPS_TO_APPS database links exist, then they should have been updated with the new port number by AutoConfig in the step "1.3.14 Implementing AutoConfig on upgraded database".

For custom self-referential database links (if any) in the database instance, use the following commands to drop and re-create them:

```bash
$ sqlplus apps/<apps password>
SQL> drop database link <custom database link>;
SQL> create database link <custom database link> connect to <user> identified by <password> using
   '(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=<hostname>)
    (PORT=<port number>))(CONNECT_DATA=(SID=<ORACLE_SID>)))';
```

where `<custom database link>`, `<user>`, `<password>`, `<hostname>`, `<port number>`, and `<ORACLE_SID>` reflect the new Oracle Net listener for the database instance.
1.3.17 Re-create grants and synonyms
You must re-create the grants and synonyms in the APPS schema as Oracle database 11g Release 2 (11.2) contains new functionality for grants and synonyms compared to previous database releases. On the administration server node, as the owner of the Applications file system, run AD Administration and select the Recreate grants and synonyms for APPS schema task from the Maintain Applications Database Objects menu.

If you are using MRC (Multiple Reporting Currencies) in your Applications system, then run the Maintain Multiple Reporting Currencies schema task to re-create MRC triggers in the APPS schema.

Change directory to $ORACLE_HOME/rdbms/admin.
Start a SQL*Plus session with sysdba privilege and shutdown the database.
Startup database using the upgrade option.
   SQL> startup upgrade

Run the utlrp.sql.
   SQL> @utlrp.sql

Bounce the database and run the utlrp.sql.
   SQL> @utlrp.sql

Check invalid objects
   SQL> select count(*) from dba_objects 
       where status = ‘INVALID’;

Use adadmin on the Administration server node to re-create grants and synonyms.

   # su - applmgr
   $ . <APPL_TOP>/APPS<SID>_<hostname>.env
   $ adadmin
   • Maintain Applications Database Entities
     • Re-create grants and synonyms for APPS schema

1.3.18 Recreate spfile from pfile

   $ cd $ORACLE_HOME/dbs
   $ sqlplus / as sysdba
   SQL> CREATE SPFILE FROM PFILE = '<ORACLE_HOME>/dbs/init<SID>.ora';

1.3.19 Apply Oracle Receivables patch
Apply Oracle Receivables patch 5753621.

1.3.20 Compile invalid objects
Check for invalid database objects before and after this step (see the “Migration prerequisites” section for details). Use adadmin on the Administration server node to compile invalid objects.

   $ adadmin
   • Compile/Reload Applications Database Entities
     • Compile APPS schema(s)

You may want to also use the utlrp.sql script on the database node to decrease the number of invalid objects in the database. Connect to the 11gR2 database using SQL*Plus with SYSDBA privileges and run the utlrp.sql script.

   $ sqlplus / as sysdba
   SQL> @?/rdbms/admin/utlrp.sql
   Check for invalid objects.
   SQL> Select count(*) from dba_objects where status = "INVALID";
1.3.21 Restart Applications server processes (conditional)
Start the database instance and Oracle Net listener for the database instance in the new 11.2.0 Oracle home. Start all the Application tier server processes.

1.3.22 Validate environment and perform a full backup
After successfully validating the E-Business Suite environment as explained in Appendix C: Validate the E-Business Suite environment, perform a full backup to complete the upgrade to 11gR2 phase. The migration process can be paused at this stage and normal business operations can resume. If time permits, the next phase can be continued immediately or during the next planned downtime.

Phase 2: Migrating Oracle Applications 11i database to HP ProLiant Linux x86-64 server

This phase includes the tasks to migrate the source 11gR2 database instance from the Oracle Sun Solaris SPARC-based server to the target HP ProLiant Linux-based server. The Oracle E-Business Suite 11i environment will be offline during part of this phase. After the completion of this phase, the Oracle E-Business Suite 11i environment can resume normal operations as a fully supported split configuration where the application tier is running on the Oracle Sun Solaris SPARC-based server and the database tier is running on the HP ProLiant Linux-based server. The instructions below are based partly on Oracle Support Portal documents: Export/import notes on Applications 11i Database 11g [ID 557738.1] and Using Oracle EBS with a Split Configuration Database Tier on 11gR2 [ID 946413.1].

During phase 2 of the migration, you will:
- Section 2.1: Prepare the source database node
- Section 2.2: Prepare the target database node
- Section 2.3: Export the source Oracle E-Business Suite R12.1 database instance
- Section 2.4: Import the Oracle E-Business Suite R12.1 database instance to the target database node
- Section 2.5: Configure the target Oracle E-Business Suite R12.1 database instance

Figure 9. Migrate Release 11i RDBMS 11gR2 to HP ProLiant server
2.1 Prepare the source database node

2.1.1 Prerequisites checks
All the prerequisites steps have been taken care during Phase 1. You can still review the "Before the Database Installation" section in Oracle Support Portal document: Interoperability Notes Oracle EBS 11i with Oracle Database 11gR2 (11.2.0.2) [ID 881505.1] and cross verify if your source E-Business Suite 11i database instance needs any latest patches.

2.1.2 Apply the export/import utility patch
Download and apply the Oracle E-Business Suite 11i export/import Patch 12353539 4/2011 Export Import Patch using the adpatch utility. This patch delivers multiple SQL scripts to execute the export and import tasks during the migration process.

2.1.3 Make a working directory
A working directory named “dpexpimp” on the source database server should be created to contain all generated files and scripts required to complete this section. For example:

```bash
$ mkdir /oratmp/dpexpimp
```

2.1.4 Generate the target database instance creation script aucrdb.sql
The export/import patch delivers the auclondb.sql script which creates the aucrdb.sql script. The aucrdb.sql script will be used to create the target database instance with the appropriate tablespace and file structure. The aucrdb.sql script will ensure that the target database instance will be created with the same tablespace structure as the source database instance. The aucrdb.sql script converts all tablespaces except for SYSTEM to locally managed tablespaces with auto segment space management, if they are not already so.

On the source administration server node, connect to the source database as SYSTEM and run the $AU_TOP/patch/115/sql/auclondb.sql script. It creates aucrdb.sql in the current directory.

```bash
$ sqlplus system/[system password] @$AU_TOP/patch/115/sql/auclondb.sql
```

2.1.5 Collect Advanced Queue settings
Collect the Advanced Queue settings before migration as they will not be moved to the target database instance during the migration process. The export / import patch contains auque1.sql, which generates a script called auque2.sql. You can use this auque2.sql script to enable the Advanced Queue settings in the target database instance later.

Copy the auque1.sql script from the $AU_TOP/patch/115/sql directory on the source administration server node to the source database server node into the working directory created in step “2.1.3 Make a working directory”. As the owner of the source database server file system, connect to the source database as SYSDBA and run the auque1.sql script. It generates auque2.sql in the current directory.

```bash
$ sqlplus /nolog
SQL> connect / as sysdba;
SQL> @auque1.sql
```

2.1.6 Remove rebuild index parameter in spatial indexes
Cross check the spatial indexes for the “rebuild index” parameter. Spatial indexes can have a “rebuild index” clause that may cause errors in the export process during migration.

To see if you have any rebuild index parameters, as the owner of the source database server file system, connect to the source database as SYSDBA and run the following command:

```sql
SQL> select * from dba_indexes where index_type='DOMAIN' and upper(parameters) like '%REBUILD%';
```

To remove the rebuild index parameter, connect to the source database as the owner of the index and run the following command:

```sql
SQL> alter index [index name] rebuild parameters [parameters];
```

where [parameters] is the original parameter set without the rebuild_index parameter.
2.2 Prepare the target database node

This section will create an empty target database and populates it with all of the required system objects prior to running import.

2.2.1 Configure Linux on the target node

Configure the HP ProLiant server and install the RHEL 5.5 operating system according to HP product installation notes. Complete the preparation steps by staging the installation media and operating system patches for 11gR2 database and R12.1 on the HP ProLiant server running Linux, apply the required operating system patches, and incorporate the required kernel parameter settings. For more information about the operating requirements for Linux, refer to Oracle Support Portal document: Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.1) for Linux x86-64 [ID 761566.1]. Modify operating system kernel parameters according to the recommended values. The document contains only suggested kernel settings and should be considered a starting point for additional operation system tuning.

2.2.2 Prepare to create the 11.2.0 database Oracle home on the HP ProLiant server

To understand the installation and upgrade processes, read Chapters 1 and 2 of the Oracle Database Installation Guide 11g Release 2 (11.2) for Linux Part Number E24321-03 and the System Considerations and Requirements section of Chapter 3 of the Oracle Database Upgrade Guide 11g Release 2 (11.2) Part Number E23633-02. Execute any additional steps that are relevant for your environment.

2.2.3 Install the 11.2.0 software

On the database server node, as the owner of the Oracle 11g file system and database instance, download and unzip the 11.2.0.2 patch set for your platform. Read the patch set notes (usually README.html). Make sure you thoroughly understand the upgrade and patch set installation process before you begin. Check Oracle Support Portal or contact Oracle Support Services to determine any known issues with the patch set and its interoperability with Oracle E-Business Suite R12. Review the tasks in the Installing the Oracle Database 11g Patch Set interactively section of the patch set notes.

Start an Xterm session on the target database server as the “oracle” user; change directory to the 11.2.0 staging area; and run the Oracle Universal Installer wizard:

```
$ cd <11.2.0_staging_directory>
$ ./runInstaller
```

Select Installation Type
- Enterprise Edition

Specify Home Details
- Name: OUIHome2
- Path: <11g_ORACLE_HOME>

Product-specific prerequisite checks
- The warning status for the OS and kernel patches can be ignored if running the prescribed software releases and kernel settings.
- Many of the required patches, as well as some kernel settings have been superseded or discontinued.

Upgrade an Existing Database
- NO

Select Configuration Option (Figure 10)
- Install database software only

Execute Configuration scripts Popup
- As root user run the following script:
  ```
  # <11gR2_ORACLE_HOME>/root.sh
  ```

End of Installation
You need to select “Install database software only” option for 11gR2 as shown in the following figure:

Figure 10. Install 11gR2 database software only
As this database is going to be used with R12.1 you can create the directory structure according to the R12.1 database $ORACLE_HOME as shown in following figure:

![Figure 11. Choose the installation directory according to your E-Business Suite Installation](image)

For more information about the changes, refer to Oracle Support Portal document: Important Changes

2.2.4 Install Oracle Database 11g products from the 11gR2 Example CD

Review the tasks in section 3.5, of Installing Oracle Database 11g Products in the Oracle Database Example CD Installation Guide for your platform. Do not perform the tasks in the Preparing Oracle Workflow Server for the Oracle Workflow Middle Tier Installation section.

Start up an Xterm session on the source database server as the “oracle” user; change directory to the 11gR2 Example CD staging area and run the Oracle Universal Installer.

Make sure that:

- The ORACLE_HOME environment variable points to the new 11.2.0 Oracle home.
- The PATH environment variable includes $ORACLE_HOME/bin and the directory where the new Perl executable is located (usually $ORACLE_HOME/perl/bin).
- The LD_LIBRARY_PATH environment variable includes $ORACLE_HOME/lib.
The PERL5LIB environment variable points to the directories where the new Perl libraries are located (usually $ORACLE_HOME/perl/lib/<perl version> and $ORACLE_HOME/perl/lib/site_perl/<perl version>).

```
$ export ORACLE_HOME=/oracle/<sid>db/11.2.0
$ export PATH=$ORACLE_HOME/bin:$ORACLE_HOME/perl/bin:$PATH:
$ export LD_LIBRARY_PATH=$ORACLE_HOME/lib
$ export PERL5LIB=$ORACLE_HOME/perl/lib/5.10.0 \ 
  :$ORACLE_HOME/perl/lib/site_perl/5.10.0
$ cd <11.2.0 Example CD staging_directory>
$ ./runInstaller
```

This patch delivers all the required components for 11gR2 as shown in following figure:

**Figure 12.** Oracle database 11gR2 Products installation

![Oracle database 11gR2 Products installation](image-url)
2.2.5 Create nls/data/9idata directory
As the owner of the 11gR2 RDBMS file system, set the ORACLE_HOME variable and run the cr9idata.pl Perl script; then set the ORA_NLS10 environment variable.

```bash
$ export ORACLE_HOME=<11gR2_ORACLE_HOME>
$ export PATH=$ORACLE_HOME/bin:$ORACLE_HOME/perl/bin:$PATH:
$ export LD_LIBRARY_PATH=$ORACLE_HOME/lib
$ export PERL5LIB=$ORACLE_HOME/perl/lib/5.10.0
:$ORACLE_HOME/perl/lib/site_perl/5.10.0
$ cd $ORACLE_HOME/nls/data/old
$ perl cr9idata.pl
$ export ORA_NLS10=$ORACLE_HOME/nls/data/11gR2data
```

After creating the directory, make sure that the ORA_NLS10 environment variable is set to the full path of the 9idata directory whenever you enable the 11gR2 Oracle home.

2.2.6 Apply additional 11.2.0 RDBMS patches
Shutdown the applications server services, database, and listener before applying the following platform specific RDBMS one-off patches. **Also apply OPatch 11.2.0.0.0 (Patch 6880880) for Linux (or the latest OPatch version for 11gR2) before applying these additional RDBMS patches.**

- 9776940 Linux x86-64
- 10149223 Linux x86-64
- 10229719 Linux x86-64

Run opatch lsinventory before and after applying patches. Review all the readme files before applying any patch and review the logs for any discrepancy after applying each patch. If any are found, resolve them first before continuing to the next step.

2.2.7 Verify one-off patch equivalence with source RDBMS ORACLE_HOME
The RDBMS software versions should be exactly equivalent on the Linux x86-64 server and Oracle Sun Solaris server in order to avoid any complications during migration of the database instance. The OPatch utility should be used to list the installed patches and confirm that the two ORACLE_HOMEs are indeed equivalent.

2.2.8 Create the target initialization parameter file and CBO parameter file
From the source database server node, copy initialization parameter files to the Oracle 11g $ORACLE_HOME/dbs directory on the target database server node. Refer to database initialization parameters (init.ora) settings for Oracle E-Business Suite R12.1 in Oracle Support Portal document: *Database Initialization Parameters for Oracle Applications Release 11g [ID 216205.1]* and update both the init.ora and ifilecbo.ora files with any necessary changes. You may also need to update initialization parameters involving the db_name, control_files, and directory structures. Ignore the initialization parameters that pertain to the native compilation of PL/SQL code. You will be instructed to add them later, if necessary.

2.2.9 Create a working directory
Create a working directory named “dpexpimp” in the target system which will contain all generated files and scripts required to complete this section. As an example,

```bash
$ mkdir /oratmp/dpexpimp
```
2.2.10 Create the target database instance

Copy the aucrdb.sql script generated in step “2.1.4 Generate the target database instance creation script aucrdb.sql” from the source database server node to the target database server node. Update the script on the target database server node with any necessary changes to the directory structures for the log file(s), data file(s), or tablespaces, reflecting the layout of the target database server node. Confirm the default temporary and undo tablespaces are according to your requirements.

Setup the environment variables appropriately on the target database server for the target database instance, especially the ORACLE_HOME, ORACLE_SID, and ORA_NLS10 environment settings. ORACLE_SID must be set to the same value as the db_name parameter in the init[SID].ora file. If the ORACLE_SID environment parameter is not set then database start in “NOMOUNT” will give following error:

---

**Figure 13. TNS error**

![Screenshot of SQL*Plus output with error message](image-url)
Also modify the init<SID>.ora file to comment the local_listener parameter to avoid an incorrect listener error while creating the new database as shown in the following figure:

**Figure 14. Listener error**

```
[oracle@rhel5 dpexpimp]$ sqlplus /nolog
SQL*Plus: Release 11.2.0.2.0 Production on Tue Oct 4 06:46:48 2011
Copyright (c) 1982, 2010, Oracle. All rights reserved.
SQL> connect / as sysdba
Connected to an idle instance.
SQL>
SQL> spool aucrdb.log
SQL> startup nomount
ORA-00119: invalid specification for system parameter LOCAL_LISTENER
ORA-00132: syntax error or unresolved network name 'LISTENER_VIS'
```

This error is expected as you may not have defined any listener yet as shown in the following figure:

**Figure 15. Missing listener files**

```
[oracle@rhel5 dbs]$ cd ../network/admin/
[oracle@rhel5 admin]$ ls samples_shrept.lst
[oracle@rhel5 admin]$ cd ../..\dbs/
```

Then, use the following commands to run aucrdb.sql and create the target database instance:

```
$ sqlplus /nolog
SQL> connect / as sysdba;
SQL> spool aucrdb.log;
SQL> startup nomount;
SQL> @aucrdb.sql
SQL> exit;
```

If PL/SQL of the source database was natively compiled, review the “Compiling PL/SQL Code for Native Execution” section of Chapter 11 of Oracle Database PL/SQL Language Reference 11g Release 2 (11.2) Part Number E10472-02 for instructions on how to natively compile PL/SQL in the target database. Add the parameters that pertain to the native compilation where specified. Do not use the natively compiled code generated by the source database. Oracle does not support switching the PL/SQL compilation mode from interpreted to native (and vice-versa). Using native mode takes significantly more time than interpreted mode.
When the target database instance has been created, restart the database instance.

**Note**
Query the `dba_free_space` and `dba_data_files` tables in the source database to get an idea of how much tablespace is required and modify the sizes of the database files in `aucrdb.sql` accordingly to ensure enough tablespace. However, this is no guarantee as the space requirements may change depending on the extent sizes used by each object. Not having enough tablespace will cause failures as well as major performance degradation in the import run. You can collect the tablespace information using following script:

```
SELECT /* + RULE */  df.tablespace_name "Tablespace",
       df.bytes / (1024 * 1024) "Size (MB)",
       SUM(fs.bytes) / (1024 * 1024) "Free (MB)",
       NVL(Round(SUM(fs.bytes) * 100 / df.bytes),1) "% Free",
       Round((df.bytes - SUM(fs.bytes)) * 100 / df.bytes) "% Used"
FROM dba_free_space fs,
     (SELECT tablespace_name,SUM(bytes) bytes
      FROM dba_data_files
      GROUP BY tablespace_name) df
WHERE fs.tablespace_name = df.tablespace_name
GROUP BY df.tablespace_name,df.bytes
UNION ALL
SELECT /* + RULE */ df.tablespace_name tspace,
       fs.bytes / (1024 * 1024),
       SUM(df.bytes_free) / (1024 * 1024),
       NVL(Round((SUM(fs.bytes) - df.bytes_used) * 100 / fs.bytes),1),
       Round((SUM(fs.bytes) - df.bytes_free) * 100 / fs.bytes)
FROM dba_temp_files fs,
     (SELECT tablespace_name,bytes_free,bytes_used
      FROM v$temp_space_header
      GROUP BY tablespace_name,bytes_free,bytes_used) df
WHERE fs.tablespace_name = df.tablespace_name
GROUP BY df.tablespace_name,fs.bytes,df.bytes_free,df.bytes_used
ORDER BY 4 DESC;
```

### 2.2.11 Copy database preparation scripts to target Oracle home

The database preparation scripts patch that was applied to the source administration server node in step “2.1.2 Apply the export/import utility patch” contains four scripts that are needed on the target database server node. Copy the following files from the `AU_TOP/patch/115/sql` directory on the source administration server node to the target database server node into the working directory created during step “2.2.9 Create a working directory”:

- `audb1120.sql`
- `ausy1120.sql`
- `aujv1120.sql`
- `aumsc1120.sql`

Review the scripts using a text editor before you run each of the next four steps and also note the following:

- The remarks section at the beginning of each script contains additional information.
- Each script creates a log file in the current directory.

### 2.2.12 Configure the SYS schema

Configure the SYS schema for use with the Applications using the `audb1120.sql` script. On the target database server node, connect to the target database instance as SYSDBA and run `audb1120.sql`.

```
$ sqlplus "/ as sysdba" @audb1120.sql
```

### 2.2.13 Configure the SYSTEM schema

Configure the SYSTEM schema for use with the Applications using the `ausy1120.sql` script. On the target database server node, connect to the target database instance as SYSTEM and run `ausy1120.sql`. 

```
2.2.14 Java Virtual Machine installation

Use aujv1120.sql to install the Java Virtual Machine (JVM) in the database. On the target database server node, connect to the target database instance as SYSTEM and run aujv1120.sql.

Here is an example:

```sql
$ sqlplus system/[system password] @aujv1120.sql
```

**Note**
This script can be run only once in a given database instance, because the scripts that it calls are not re-runnable.

2.2.15 Other required components installation

Use aumsc1120.sql script to install the following required components in the database: ORD, Spatial, XDB, OLAP, Data Mining, interMedia, and ConText. On the target database server node, connect to the target database instance as SYSTEM and run aumsc1120.sql. You must pass the following arguments to the script, in the order specified:

**Table 5. Arguments for aumsc1120.sql**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>remove context?</td>
<td>FALSE</td>
</tr>
<tr>
<td>SYSAUX tablespace</td>
<td>SYSAUX</td>
</tr>
<tr>
<td>temporary tablespace</td>
<td>TEMP</td>
</tr>
</tbody>
</table>

Example:

```sql
$ sqlplus system/[system password] @aumsc1120.sql FALSE SYSAUX TEMP
```

**Note**
All of the components are created in the SYSAUX tablespace regardless of where it was installed in the source database.

2.2.16 Disable automatic gathering of statistics

Copy $APPL_TOP/admin/adstats.sql from the administration server node to the target database server node. Connect to the database as SYSDBA and use the following commands to restart the database in restricted mode and run adstats.sql:

```sql
$ sqlplus "/ as sysdba"
SQL> shutdown normal;
SQL> startup restrict;
SQL> @adstats.sql
SQL> exit;
```

2.2.17 Backup the target database instance

The target database instance is now prepared for an import of the Applications data. You should perform a backup before starting the import.
2.3 Export the source Oracle E-Business Suite 11i database instance

After a successful installation of RDBMS 11gR2 on the target database node, export the source Applications 11i database and import into the target database node.

This section describes the detailed steps for exporting data from the source Oracle Applications database.

2.3.1 Modify the export parameter files

Copy the $AU_TOP/patch/115/import/auexpdp.dat data pump parameter file created in step “2.1.4 Generate the target database instance creation script aucrdb.sql” from the source administration server node to the working directory in the source database server node. Modify the parameter file according to the source environment and other customized parameters using a text editor. Make a backup of any parameter file before modifying.

Table 6. Customizable parameters in export parameter file

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Template value</th>
</tr>
</thead>
<tbody>
<tr>
<td>directory</td>
<td>directory where export dump files will be created</td>
<td>dmpdir</td>
</tr>
<tr>
<td>dumpfile</td>
<td>export dump file name(s)</td>
<td>aexp%U.dmp</td>
</tr>
<tr>
<td>filesize</td>
<td>export dump file size</td>
<td>1 GB</td>
</tr>
<tr>
<td>log</td>
<td>Log file name</td>
<td>expdpapps.log</td>
</tr>
</tbody>
</table>

You can also edit the export parameter file for any additional parameter, for example, “PARALLEL” for faster export process.

Other schemas – for example, interMedia, OLAP, and Data Mining schemas – are not exported. The aumsc1120.sql script creates these schemas in the target database if required. Ensure that the schema names in the exclude parameters reflect those in your database.

Create a directory in the system schema that corresponds to the directory specified in the template. For example:

```
$ sqlplus system/[system password]
SQL> create directory dmpdir as '/oratmp/dpexpimp';
```

Comment out or remove the transform parameter. It is used only for the import process. Do not change the other parameters.

The export process uses as many of the listed file names as necessary to hold the exported data. You must ensure that the number of dump files specified, as well as the size of each dump file, is sufficient to contain all the data in your source database instance.

2.3.2 Shut down Applications server processes

Shut down all Applications server processes except the database and the Net Services listener for the database. Users cannot use the Applications until the import is completed.

2.3.3 Grant privilege to source system schema

Connect to the database as SYSDBA and use the following command to grant the exempt access policy privilege to system:

```
SQL> grant EXEMPT ACCESS POLICY to system;
```

2.3.4 Export OLAP analytical workspaces (optional)

The export/import of OLAP analytical workspaces may take up a lot of resources. It may cause memory issues such as bug 10331951. Customers who use OLAP may export/import OLAP through the DBMS_AW package directly as an alternative.
Perform the detailed steps 1-3 as documented in Oracle Support Portal document: *Migrating OLAP From 32 To 64 Bits [ID 352306.1]*, to export OLAP analytical workspaces on the source machine. Copy the export files to the target machine.

### 2.3.5 Export the Applications database instance

Run the following command (for source database 11.2.0) to start an export session on the source database server node using the auexpdp.dat parameter file:

```bash
$ expdp "'/ as sysdba" parfile=auexpdp.dat
```

If the source database is 10.2.0 or 11.1.0, use the following command:

```bash
$ expdp system/[system password] parfile=[export parameter file name]
```

Typically, the export runs for several hours and depends on the size of the database. It may be a good time to purge and archive data no longer used to reduce the database size.

### 2.3.6 Revoke privilege from source system schema

Connect to the database as SYSDBA and revoke the exempt access policy privilege from system using the following command:

```sql
SQL> revoke EXEMPT ACCESS POLICY from system;
```

### 2.4 Import the Oracle E-Business Suite R12.1 database instance to the target database node

This section describes the detailed steps to import data into the target database.

#### 2.4.1 Copy the export dump files

If you have not already moved or copied the export dump files from the source DB node to the target DB node in the previous steps, then copy all the export dump files generated in step “2.3 Export the source Oracle E-Business Suite 11i database instance” from the source database server node to the target database server node.

#### 2.4.2 Edit and create the import parameter files

Copy the export parameter file you created in Section 1 (*auexpdp.dat*) from the source database server node to the working directory in the target database server node, renaming it to *auimpdp.dat* (if necessary). Updating the new file with the following changes converts it to an import parameter file:

- Remove the exclude parameters.
- Remove the filesize parameter.
- Change the name of the log file.
- Uncomment the transform parameter.

Create a directory in the system schema with the name set to the directory specified in the template and the path set to where the export dump files will reside.

For example:

```bash
$ sqlplus system/[system password]
SQL> create directory dmpdir as '/oratmp/dpexpimp';
```

Save the changed file.

#### 2.4.3 Set Oracle Text parameter (conditional)

As the target database is 11.2.0, use SQL*Plus to connect to the target database as SYSDBA and run the following command to grant datastore privileges:

```bash
$ sqlplus "'/ as sysdba"
SQL> exec ctxsys.ctx_adm.set_parameter ('file_access_role', 'public');
```
2.4.4 Import the Applications database instance
If your source database is Oracle Database 11g (11.x), remove or comment out all the exclude parameters in the auimpdp.dat parameter file. If your source database is Oracle Database 10g Release 2 (10.2.0), leave the parameter file as it is.

Import the database using the following command to start the import on the target database server node using the auimpdp.dat parameter file.

If the target database is 11.2.0:

$ impdp "'/ as sysdba'" parfile=auimpdp.dat

If the target database is 11.1.0:

$ impdp system/ [system password] parfile=[export parameter file name]

Typically, import runs for several hours. You can also edit the import parameter file for any additional parameter, for example, “PARALLEL” for faster export process.

---

Note
As explained earlier, the import process (IMPDP) may hang without doing anything. Cross check the Job status and confirm the status as “Executing”:

```
SQL> select
USERNAME,OPNAME,TARGET_DESC,SOFAR,TOTALWORK,UNITS,MESSAGE
from V$SESSION_LONGOPS where OPNAME='SYS_IMPORT_FULL_01';
```

Useful tables for datapump process:

- DBA_DATAPUMP_JOBS
- USER_DATAPUMP_JOBS
- DBA_DATAPUMP_SESSIONS

Database alert log will show following message:

```
statement in resumable session 'SYS.SYS_IMPORT_FULL_01.1' was timed out
statement in resumable session 'SYS.SYS_IMPORT_FULL_01.1' was suspended due to ORA-01658: unable to create INITIAL extent for segment in tablespace OPMOR
```

The solution is to alter the tablespace sizes for problematic tablespaces:

```
SQL> alter tablespace OPMOR add datafile
'/oracle/EBS/db/apps_st/data/opmor02.dbf' size 50M
```

Once the tablespace has been extended the import process will resume the import. Database alert log will show the following message:

```
statement in resumable session 'SYS.SYS_IMPORT_FULL_01.1' was resumed
```

---

2.4.5 Import OLAP analytical workspaces (conditional)
If you exported OLAP analytical workspaces, perform the detailed step 7 as documented in My Oracle Support Note 352306.1 to import the OLAP analytical workspaces that were previously exported from the source machine.

---

2.4.6 Revoke privilege from target system schema
Connect to the database as SYSDBA and revoke the exempt access policy privilege from system using the following command:

```
SQL> revoke EXEMPT ACCESS POLICY from system;
```
2.5 Configure the target Oracle E-Business Suite R12.1 database instance

This section explains the post-import steps required to restore the target database to a fully functional state.

2.5.1 Reset Advanced Queues

Copy the aque2.sql script that was generated in step “2.1.5 Collect Advanced Queue settings” to the target database server node. Then, on the target database server node, as the owner of the Oracle 11gR2 file system, connect to the target database as SYSDBA and run the aque2.sql script to enable the Advanced Queue settings that were lost during the process. The script creates a log file in the current directory.

```
$ sqlplus "/ as sysdba" @aque2.sql
```

2.5.2 Start the new database listener

Start the Oracle Net listener for the database instance in the new Oracle home if it has not been started. You need to create the listener for the new database SID using “netca”. Start the listener with the lsnrctl executable since AutoConfig has not yet been implemented as shown in following figure:

Figure 16. Setting up new database listener
The "netca" utility will start the listener as shown in the following figure:

**Figure 17. Listener startup**

```bash
[oracle@rhel5 admin]$ netca
Oracle Net Services Configuration:
Configuring Listener:VIS
Listener configuration complete.
Oracle Net Listener Startup:
    Running Listener Control:
        /EBSDB/db/tech_st/11.2.0/bin/lsnrctl start VIS
    Listener Control complete.
    Listener started successfully.
Oracle Net Services configuration successful. The exit code is 0
```

Also, create service for tnsping using "netmgr" as shown in the following figure:

**Figure 18. Listener service creation**

Edit the init<SID>.ora file to include the new "listener_name" and restart the database.
If the database has not been started with the new listener then a future database connection may fail with errors as shown in the following figure:

**Figure 19.** Missing listener error

ORA-12505, TNS:listener does not currently know of SID given in connect descriptor or occurred while connecting to the database - VIS

Could not Connect to the Database with the above parameters, Please answer the questions below

See the Oracle Database Net Services Administrator’s Guide 11g Release 2 (11.2) Part Number E10836-07 for more information.

$ lsnrctl status <SID>

**Note**
Set the TNS_ADMIN environment variable to the directory where you created your listener.ora and tnsnames.ora files.

### 2.5.3 Run adgrants.sql

Copy $APPL_TOP/admin/adgrants.sql from the administration server node to the database server node. Connect to the database as SYSDBA and run the script using the following command:

$ sqlplus "/ as sysdba" @adgrants.sql [APPS schema name]

**Note**
Verify the usage of adgrants.sql in the adgrants.sql script. Older versions of adgrants.sql require the APPLSYS schema name parameter to be passed instead of APPS.

### 2.5.4 Grant create procedure privilege on CTXSYS

Copy $AD_TOP/patch/115/sql/adctxprv.sql from the administration server node to the database server node. Connect to the database as APPS and run the script using the following command:

$ sqlplus apps/[APPS password] @adctxprv.sql [SYSTEM password] CTXSYS

### 2.5.5 Set CTXSYS parameter

Use SQL*Plus to connect to the database as SYSDBA and run the following command:

$ sqlplus "/ as sysdba"
SQL> exec ctxsys.ctx_adm.set_parameter('file_access_role', 'public');

### 2.5.6 Deregister the current database server (conditional)

If you plan to change the database port, host, SID, or database name parameter on the database server, you must also update AutoConfig on the database tier and deregister the current database server node.

Use SQL*Plus to connect to the database as APPS and run the following command:

$ sqlplus apps/[APPS password] 
SQL> exec fnd_conc_clone.setup_clean;
2.5.7 Migrate the AD Utilities to the target database server node

This task will enable migration of the AD Utilities from the source server node to the target database server node. For more information, refer to Section 5 of Oracle Support Portal document: Using AutoConfig to Manage System Configurations with Oracle Applications 11i [ID 165195.1]. In summary:

Update the ORACLE_HOME with the AutoConfig files by performing the following steps:

1. On the Application Tier (as the Applications file system user):
   - Log in to the APPL_TOP environment (source the environment file).
   - Create appsutil.zip file
     \$ perl \$AD_TOP/bin/admkappsutil.pl
   - This action will create appsutil.zip in $APPL_TOP/admin/out directory.

2. On the Database Tier (as the Oracle user):
   - Copy and unzip the appsutil.zip file to the <RDBMS ORACLE_HOME>
     \$ cd <RDBMS ORACLE_HOME>
     \$ unzip -o appsutil.zip

   - Verify that the following environment settings are set properly:
     \$ export ORACLE_SID=<SID>
     \$ export ORACLE_HOME=<11gR2_ORACLE_HOME>
     \$ export PATH=$ORACLE_HOME/bin:$PATH:
     \$ export TNS_ADMIN=$ORACLE_HOME/network/admin/<SID>_<hostname>
     \$ export ORA_NLS10=$ORACLE_HOME/nls/data/9idata
     \$ export LD_LIBRARY_PATH=$ORACLE_HOME/lib
     \$ export SHLIB_PATH=$ORACLE_HOME/lib
   - Run the AD build XML Perl script:
     \$ cd $ORACLE_HOME/appsutil/bin
     \$ perl adbldxml.pl tier=db appsuser=apps \ appspass=<apps_password>
   - The context file and its creation log were generated in the following locations:
     Context File = $ORACLE_HOME/appsutil/<SID>_<hostname>.xml
     Log = $ORACLE_HOME/appsutil/log/adbldxml_*.log

4. Run AutoConfig on the target database node:
   \$ cd $ORACLE_HOME/appsutil/bin
   \$ ./adconfig.sh \ contextfile=<11gR2_ORACLE_HOME>/appsutil/<SID>_<hostname>.xml \ appspass=<apps_password>

   To complete this task shutdown all database processes including the listener, source the newly created environment file, and startup the listener and database.

5. Update context parameters using OAM or a text editor on the source middle tier node (Oracle Sun SPARC server running Solaris) and run AutoConfig:
   \$ cd $COMMON_TOP/admin/scripts/<SID_hostname>
   \$ sh adautocfg.sh
2.5.8 Gather statistics for SYS schema
Copy $APPL_TOP/admin/adstats.sql from the administration server node to the database server node. If you are upgrading to R12, use the R12 version of the file. Note that adstats.sql has to be run in restricted mode. Use SQL*Plus to connect to the database as SYSDBA and use the following commands to restart the database in restricted mode, run adstats.sql, and restart the database in normal mode:

$ sqlplus "/ as sysdba"
SQL> shutdown normal;
SQL> startup restrict;
SQL> @adstats.sql
SQL> shutdown normal;
SQL> startup;
SQL> exit;

Note
Make sure that you have at least 1.5 GB of free default temporary tablespace.

2.5.9 Re-create custom database links (conditional)
If you have created a new or different Oracle Net listener in the 11.2.0 Oracle home, then you must re-create any custom self-referential database links that exist in the source applications database instance. Cross check the existence of database links. Connect to the applications database instance as APPS and run the following query:

$ sqlplus apps/<apps password>
SQL> select db_link from dba_db_links;

The EDW_APPS_TO_WH and APPS_TO_APPS database links, if they exist, should have been updated with the new port number by AutoConfig in step “2.5.7 Migrate the AD Utilities to the target database server node”.

Cross check custom self-referential database links (if any) in the database instance. You can use the following commands to drop and re-create them:

$ sqlplus apps/<apps password>
SQL> drop database link <custom database link>;
SQL> create database link <custom database link> connect to <user>
identified by <password> using
'(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=<hostname>)
(PORT=<portnumber>))(CONNECT_DATA=(SID=<ORACLE_SID>)))';

where <custom database link>, <user>, <password>, <hostname>, and <ORACLE_SID> are all as they were in the source database link definition, and <portnumber> is the port number of the new Oracle Net listener for the database instance.

2.5.10 Apply Oracle Human Resources (HRMS) patch 7721754 (conditional)
If you are using Oracle HRMS, apply patch 7721754.

2.5.11 Re-create grants and synonyms
Oracle Database 11g Release 2 (11.2) contains new functionality for grants and synonyms compared to previous database releases. As a result, you must re-create the grants and synonyms in the APPS schema. On the administration server node, as the owner of the Applications file system, run AD Administration and select the “Recreate grants and synonyms for APPS schema” task from the Maintain Applications Database Objects menu.

2.5.12 Enable Database Vault (conditional)
If you disabled Database Vault, enable it by performing step 7 of Part 2 of document 1091086.1 on My Oracle Support.

2.5.13 Create OWA_MATCH package (conditional)
If you are using iAS 1.0.2, perform the steps in document 312165.1 to create SYS.OWA_MATCH on the target database.
2.5.14 Create ConText objects
Certain ConText objects are not preserved by the import process. The consolidated export/import utility patch that you applied to the source administration server node in Section 1 contains a Perl script, dpost_imp.pl that you can run to generate an AutoPatch driver file. Use this driver file to call the scripts that create these objects. Run the following command:

```
$ perl $AU_TOP/patch/115/driver/dpost_imp.pl [driver file]
```

Once the driver file has been generated, use AutoPatch to apply it on the target administration server node.

2.5.15 Compile invalid objects
On the target database server node, as the owner of the Oracle 11g file system and database instance, use SQL*Plus to connect to the target database as SYS and run the $ORACLE_HOME/rdbms/admin/utlrp.sql script to compile invalid objects.

```
$ sqlplus "/ as sysdba" @$ORACLE_HOME/rdbms/admin/utlrp.sql
```

2.5.16 Maintain Applications database objects
Run AD Administration on the target administration server node. From the Maintain Applications Database Objects menu, perform the following tasks:

- Compile flexfield data in AOL tables.
- Recreate grants and synonyms for APPS schema.

If you use Multiple Reporting Currencies:

- Maintain Multiple Reporting Currencies schema.
- Enter Yes for the following options:
  - Update MRC schema itself
  - Compile invalid objects after updating MRC schema objects
  - Recreate MRC triggers in the APPS schema

2.5.17 Start Applications server processes
Start all the database server processes on the target system. You can allow users to access the system at this time.

2.5.18 Create DQM indexes
Create DQM indexes by following these steps:

- Log on to Oracle Applications with the “Trading Community Manager” responsibility.
- Click Control > Request > Run.
- Select “Single Request” option.
- Enter “DQM Staging Program” name.
- Enter the following parameters:
  - Number of Parallel Staging Workers: 4
  - Staging Command: CREATE_INDEXES
  - Continue Previous Execution: NO
  - Index Creation: SERIAL:
  - Click “Submit”
2.5.19 Gather Applications statistics (conditional)
If you encountered failures importing statistics, gather the statistics by following these steps:

- Ensure that there are no concurrent programs running.
- Log on to Oracle Applications with the “System Administrator” responsibility.
- Click Navigation List > Request > Run.
- Enter appropriate parameters. Specify “ALL” in the schema name to gather statistics for all database objects. You may choose individual schemas to make the process run faster.
- Click “Submit”.

2.5.20 Validation tasks
Verify that the migrated database functions properly with the source Application Tier environment. The Oracle E-Business Suite R12.1 environment is now in a fully supported mixed platform architecture with the R12 application tier services running on the Oracle Sun SPARC-based server running Solaris and the database instance 11gR2 is running on the HP ProLiant server running Linux x86.

Verify the database server hostname and database release version:

- Go to the Oracle E-Business Suite Rapid Install Portal and log on to the E-Business Suite home page as the sysadmin user.
- Select a responsibility (such as the System Administrator responsibility).
- Click on any form, such as the Concurrent -> Requests form.
- From the Help menu click “About Oracle E-Business Suite”, and verify that the server hostname and release version correspond to those of the new HP ProLiant database server.

After successfully validating the E-Business Suite environment as per Appendix C, perform a full backup to complete the database migration. The migration process can be paused at this stage and normal business operations can resume. If time permits, the next phase can be continued immediately or during the next planned downtime.
Phase 3: Migrating to E-Business Suite Release 12.1.1

Phase 3 will prepare the 11gR2 database instance to be E-Business Suite Release 12.1 aware and then install the new E-Business Suite Release 12.1.1 applications home on the target HP ProLiant server running Linux x86-64.

The Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1, Part Number E14010-01, will be used extensively to complete the final phase of this migration. Thoroughly read and understand the procedures in this guide before continuing.

This phase could have significant downtime and product specialists and application DBAs should work closely during this phase of the migration. This section includes the following tasks:

- Section 1: Prepare source for E-Business Suite Release 12.1.1 upgrade
- Section 2: Upgrade to E-Business Suite Release 12.1.1
- Section 3: Perform post upgrade product specific tasks

Your downtime will vary based on the hardware resources you are migrating from/to, etc. You should establish and tune your downtime requirements during multiple migration tests so downtime requirements are effectively communicated to the functional users.

Figure 20. Upgrade to Release 12.1.1 on HP ProLiant server

3.1 Prepare source for E-Business Suite Release 12.1.1 upgrade

The detailed planning process begins with reviewing the Oracle Support Portal document: 761570.1, Oracle Database Preparation Guidelines for E-Business Suite Release 12.1.1 upgrade. This note should be used to determine the specific upgrade path and the required database patches to be applied to prepare for the upgrade.

This project will use “Path E: Upgrade Path for Systems with 11.5.10.2 with an 11.1.0.6, 11.1.0.7, 11.2.0.1, or 11.2.0.2 Database”, which is applicable for Applications Release 11.5.10.2 with 11gR2 database. Closely review Chapter 1, “Planning for an Upgrade” of the Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1, Part Number E14010-01.

After determining the details of the upgrade plan, review the steps in the Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1, Chapter 2. Also review the Oracle Support Portal document: Planning Your Oracle E-Business Suite Upgrade from Rlease 11i to Release 12.1 [ID 987516.1]. This note describes more details about possible hurdles and proactive steps for upgrade.

3.1.1 Apply 11i.AD.I Minipack

If you have not previously done so, apply the latest 11i.AD.I minipack on all application tier nodes. For more information, refer to Oracle Support Portal document: 233044.1, About Oracle E-Business Suite DBA Minipack 11i.AD.I. Make sure that the AutoConfig is migrated over to the database node before continuing.
3.1.2 Run the Upgrade Manual Scripts (TUMS) utility

The TUMS utility reviews the current Oracle Applications Release 11i environment and creates a report that lists all the tasks that can be omitted during the upgrade process. TUMS is delivered in a patch, which supplies the scripts you need to examine your system and create the report.

Download and apply Oracle Applications patch 7705743: TUMS for R12: To Deliver TUMS Utility For Upgrades From 11i To R12 to the administration server node on your Release 11i APPL_TOP. The patch supplies the script (adtums.sql) to generate the TUMS report (tumsr12.html).

To generate the TUMS report, login as the applications administrator and source the environment. Then change to the “$AD_TOP/patch/115/sql” directory and run the adtums.sql script.

$ cd $AD_TOP/patch/115/sql
$ sqlplus apps/<apps_password> @adtums.sql <DIRECTORY>

For the <DIRECTORY> value, enter the full path of the directory to which you want the report to be written. This directory must be listed in the UTL_FILE_DIR parameter of the init.ora file before TUMS can write the report.

The report will be generated on the database node: <DIRECTORY>/tumsr12.html.

See Appendix A to view the TUMS report for this project.

3.1.3 Database and system administration tasks

These tasks are executed on the Release 11i APPL_TOP. Complete all tasks in the “Database and System Administration Tasks” section of Chapter 2, “Preparing for the Upgrade”, in the Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1, Part Number E14010-01, excluding the ones listed in the TUMS report, before continuing with the product-specific tasks.

3.1.4 Product-specific tasks

These tasks are executed on the Release 11i APPL_TOP. Complete all tasks in the “Applications Technology Tasks” and “Product Specific Tasks” sections of Chapter 2, “Preparing for the Upgrade”, in the Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1, Part Number E14010-01, excluding the ones listed in the TUMS report, before continuing with the final preparations for upgrade task.

This section completes the final preparation tasks for your existing Release 11i system and installs the new Oracle E-Business Suite Release 12.1.1 environment. These tasks are derived from the “Prepare for the Upgrade” sections of Chapter 2, “Preparing for the Upgrade”, in the Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1, Part Number E14010-01.

3.1.5 Gather schema statistics for CBO (required)

Release 12.1 employs cost-based optimization, which examines FND table statistics to determine the most efficient access paths and join methods for executing SQL statements. These statistics are gathered by the FND_STATS process, which you initiate by running the Gather Schema Statistics concurrent program.

From Release 11i APPL_TOP, complete the following steps:
1. Log in to Oracle E-Business Suite 11i instance with the System Administrator responsibility.
2. Navigate to the Submit Request window (Request > Run).
3. Submit the Gather Statistics program (Schema).

Set the schema name to ALL to gather statistics for all Oracle E-Business Suite schemas (having an entry in the FND_PRODUCT_INSTALLATIONS table). In addition to gathering index and table-level statistics, the program gathers column-level histogram statistics for all columns listed in the FND_HISTOGRAM_COLS table.

Note
Gather schema statistics on a regular basis to fully utilize the cost-based optimization feature. In preparation for an upgrade, this needs to be one of the last tasks you perform before initiating the upgrade so that the statistics are current.
3.1.6 Backup the database (recommended)
Make a cold backup of the Oracle E-Business Suite database. If any problems occur during the upgrade process the only method to rollback is to restore your system from a recent backup.

Shut down the entire Release 11i environment and make sure that the database is shut down with the NORMAL option. Using the IMMEDIATE or ABORT option may result in an unusable database backup.

3.1.7 Prepare the R12.1.1 Applications node and run Rapid Install (required)
Prepare the HP ProLiant server for E-Business Suite Release 12.1.1 target application node. See section 2.2 Prepare the target database node, within this document, for preparing the target server and then use the Rapid Install wizard to lay down the file system and install the new technology stack for your Oracle E-Business Suite Release 12.1.1 system.

Before running Rapid Install, modify the database node sqlnet.ora file to recognize the new HP ProLiant server Release 12.1.1 application node.

Edit the sqlnet.ora to include the <new_host_name> in the "tcp.invited_nodes" section. Once the sqlnet.ora file has been updated, restart the listener process on the database server so that the target applications server can properly connect to the remote database.

Run Rapid Install and supply basic information about your system such as port specifications, existing and new database node descriptions (including mount points), user names and passwords, product license types, internationalization and language settings, and mount points for other nodes in your system.

2. Logon to the HP ProLiant server designated as the new applications R12.1.1 node as the owner of the applications file system and change to:
   "<R12.1.1 staging area>startCD/Disk1/rapidwiz."
3. Start Rapid Install by typing rapidwiz on the command line. The Welcome screen lists the components that are included in, or supported by, this release of Oracle E-Business Suite. Click Next.
4. On the Wizard Operation screen, select **Upgrade to Oracle E-Business Suite Release 12.1.1**. Click **Next**.

On the Select Upgrade Action screen, select **Create Upgrade File System** as shown in following figure:

**Figure 21. Create Upgrade File System**
5. Configure the database node specifying the database hostname and directory structure as shown in following figure:

**Figure 22. Database Node Configuration**
6. Configure the middle tier node specifying the database hostname and directory structure as shown in the following figure:

**Figure 23. Middle Tier Node configuration**
7. Rapid Install will validate the necessary requirement on the node before setting up the file system as shown in following figure:

**Figure 24. System Configuration Validation**
8. In the associated screen flow, enter the parameters required to set up your new environment and run Rapid Install.

9. Rapid Install will confirm the upgrade file system as shown in following figure:

![Image of File System Upgrade](image)

**Figure 25. File system Upgrade**

10. This has completed the R12.1 upgrade file system for upgrade.

### 3.1.8 Migrate or upgrade your database Oracle 11gR2

Review Oracle Support Portal document: 761570.1, *Database Preparation Guidelines for an Oracle E-Business Suite Release 12.1.1 Upgrade,* “Path E: Upgrade Path for Systems with 11.5.10.2 with an 11.1.0.6, 11.1.0.7, 11.2.0.1, or 11.2.0.2 Database”.

Apply listed interim patches for Path D. It may possible that some of the one-off patches have already been applied. Hence, query the Inventory:

```
>opatch lsinventory |grep <One-off patch number>
```

### 3.2 Upgrade to E-Business Suite Release 12.1.1

This section describes the tasks required to initiate the upgrade process. All the tasks must be performed during the upgrade downtime.

#### 3.2.1 Upgrading to E-Business Suite Release 12.1.1


**Notes**


There are two options in Step 3 of the above guide: Migrate database to Oracle 11g Release 2, Patch the existing 11gR2 home or install a new 11gR1 home using Release 12.1.1 Rapid Install.
3.2.2 Finish the upgrade


All the tasks are performed on the Release 12.1.1 APPL_TOP and should be completed during system downtime.

3.3 Perform post upgrade product specific tasks

This section describes tasks that complete the upgrade for specific products.

Complete all tasks in Chapter 4, Post-upgrade Tasks in the Upgrade Guide: Release 11i to Release 12.1.1, excluding the tasks listed in the TUMS report.

This section includes the following tasks:

- Applications technology tasks
- Customer relationship management tasks
- Financials and procurement tasks
- Human resources tasks
- Intelligence tasks
- Projects tasks
- Supply chain management tasks
- System maintenance tasks
- Additional tasks

This completes the Oracle E-Business Suite upgrade to Release 12.1.1.

Shut down the environment and perform a full backup of the environment. Perform validation testing as listed in Appendix C, and then clone the environment for use with production support environment.

Oracle E-Business Suite Release 12.1.1 is now available.
Appendix A: Oracle E-Business Suite R12 Upgrade Report (TUMS) – VIS

Please review the following example of a TUMS Report:

**Unnecessary steps**

Based on the analysis of your installation, it has been determined that you do not need to perform the following upgrade steps. You may safely omit carrying out these steps from the Upgrading Oracle Applications Release R12 manual during your upgrade.

**Chapter 2: Preparing for the Upgrade**

- Application Object Library, Step 1 (FND_ENABLE_MULTI_ORG)
- Application Object Library, Step 3 (FND_WORKFLOW_TASKS)
- Marketing, Step 1 (AMS_OSO_PLM_CHK)
- Incentive Compensation, Step 1 (CN_PAYRN_REP_CHK)
- Oracle Financials (India), Step 1 (JAI_CHECK_CUST)
- Internet Expense, Step 1 (OIE_IMPORT_INTERCOMPANY_CHECK)
- iPayment, Step 2 (IBY_SEC_UPGRADE)
- Depot Repair, Step 1 (CSD_DATA_CHECK)
- Service Contracts, Step 1 (OKS_VALIDATE_GCD)
- Service Contracts, Step 2 (OKS_VALIDATE_RULE)

**Chapter 4: Post-Upgrade Tasks**

- iPayment, Step 1 (IBY_WALLET_SETUP)
- iPayment, Step 3 (IBY_REMIT_ADV_CONTROL_IT)
- Oracle Financials (India), Step 1 (JAI_CHECK_PA_CUST)
- Human Resources, Step 5 (PER_RIW_WINRUNNER)

**Appendix E: Reducing Downtime**

- Service Contracts, Step 1 (OKS_R12_MIGRATE)
Appendix B: Recommended Oracle Support Portal documents

This list enumerates the Oracle Support Portal documents that are explicitly referenced in the above documentation of the platform migration and E-Business Suite upgrade process. Several additional notes were also included for your convenience.

**Preliminary phase**
- 316365.1 Oracle Applications Release 11.5.10.2 Maintenance Pack Installation Instructions
- 248857.1 Oracle E-Business Suite Tablespace Model Release 11i – Tablespace Migration Utility
- 216550.1 Oracle Applications Release 11i with Oracle9i Release 2 (9.2.0)

**Phase 1: Upgrading the Source database to 11gR2**
- 881505.1 Interoperability Notes Oracle EBS 11i with Oracle Database 11gR2 (11.2.0.2)
- 730365.1 Oracle Database Upgrade Path Reference List
- 125767.1 Upgrading Developer 6i with Oracle E-Business Suite 11i
- 216205.1 Database Initialization Parameters and Configuration for Oracle Applications Release 11i
- 165195.1 Using AutoConfig to Manage System Configurations with Oracle E-Business Suite 11i
- 233436.1 Installing Oracle E-Business Suite Server 10g with Oracle Applications Release 11i
- 312349.1 Remove Oracle Portal 3.0.9 from E-Business Suite 11i

**Phase 2: Migrating 11gR2 DB to target HP ProLiant server running Linux**
- 557738.1 Export/import notes on Applications 11i Database 11g
- 946413.1 Using Oracle EBS with a Split Configuration Database Tier on 11gR2
- 761566.1 Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.1) for Linux x86-64
- 1189783.1 Important Changes to Oracle Database Patch Sets Starting With 11.2.0.2
- 216205.1 Database Initialization Parameters for Oracle Applications Release 11i
- 224346.1 OPatch - Where Can I Find the Latest Version of OPatch?
- 352306.1 Migrating OLAP From 32 To 64 Bits

**Phase 3: Migrating to E-Business Suite Release 12.1.1**
- 761566.1 Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.1) for Linux x86-64
- 1058763.1 Interoperability Notes Oracle E-Business Suite Release R12 with Oracle 11g Release 2 (11.2.0)
- 396009.1 Database Initialization Parameter Settings for Oracle Applications Release 12
- 387859.1 Using AutoConfig to Manage System Configurations in Oracle E-Business Suite Release 12
- 987516.1 Planning Your Oracle E-Business Suite Upgrade from Release 11i to Release 12.1
- 761566.1 Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.1) for Linux x86-64
Appendix C: Validate the E-Business Suite environment

Execute the following steps to validate your E-Business Suite environment:

1. Make sure your Database and Database Listener is up and running.
2. Make sure that all the Middle Tier Services are up and running using AD Scripts located at $INST_TOP/admin/scripts, for example:
   
   ```
   $sh adopmnctl.sh status
   ```

3. Cross check if Oracle HTTP Web Server is serving the HTTP requests:
   
   ```
   http(s)://<hostname>.<domain name>:<HTTP Port>
   ```

   Where `<hostname>.<domain name>` is the Machine Name on which Oracle HTTP Web Server is running. If you are using a load balancer or Proxy Server in front of Web Server then use the load balancer / Proxy Server Name and port on which Oracle HTTP Web Server is listening.
   
   This information is configured in $ORA_CONFIG_HOME/10.1.3/Apache/Apache/conf/httpd.conf

4. Cross check if OA CORE services are working or not?
   
   ```
   http(s)://<host><domain>:<port>/OA_HTML/ServletPing
   http(s)://<host><domain>:<port>/OA_HTML/OA.jsp?OAFunc=OAHOMEPAGE
   ```

5. Login check, try login as:
   
   ```
   http://<host name>.<domain name>:<HTTP port>/oa_servlets/AppsLogin
   or
   http://<host name>.<domain name>:<HTTP port>/OA_HTML/AppsLocalLogin.jsp
   ```

6. Form Server check:
   
   a) Select any Forms based responsibility from the user home page (SSWA Home Page, OAHOMEPAGE). This should launch Forms Applet in J2SE Plug-in
   
   b) Directly launching Forms Applet,
      
      ```
      http://<host name>.<domain name>:<HTTP port>/forms/frmservlet
      ```

7. (Conditional)
   
   Check AOL/J Health i.e. Application Object Library and Java.
   
   Access and execute the full AOL/J test with `http(s)://<host><domain>:<port>/OA_HTML/jsp/fnd/aoljtest.jsp`
   
   Execute each step; any exception/error will be shown in red color.

8. Concurrent Manager check:
   
   a) Login as System Administrator, Select “Administer Concurrent Manager” and check if “Actual” and “Target” are the same.
   
   b) Navigate to Concurrent request and submit “Active Users” concurrent request to check if requests are getting executed.

9. Reports Server check: Change “Active Users” reports output from “Text file” to “PDF” from Define Concurrent Request Screen. Submit Active Users request and click on Output, check if you can see the report in PDF format.

10. Workflow Check: Login to OAM (Oracle Application Manager), on top right of page from “Navigate to” select “Workflow Manager” from the drop down menu and click on the GO button. Check if “Notification Mailers” is up.
11. Workflow status:

```sql
SQL>select fsc.COMPONENT_NAME, fsc.STARTUP_MODE, fsc.COMPONENT_STATUS from APPS.FND_CONCURRENT_QUEUES_VL fcq, fnd_svc_components fsc where fsc.concurrent_queue_id = fcq.concurrent_queue_id(+)
order by COMPONENT_STATUS, STARTUP_MODE, COMPONENT_NAME;
```

12. Cross check if iHelp is working or not?

a) In the SSWA Home Page, click on the “Help” icon at the top of the screen.

b) In the forms-based Applications, click on the “?” icon on the toolbar and also select the “Help -> Oracle Applications Library” option from the menu bar; then test the search utility by searching for a common keyword such as “form”.

13. Invalid Objects (Post Patch/Upgrade):

```sql
SQL>select owner, count(*) from dba_objects where status = 'INVALID' group by owner;

SQL>select count(object_type), object_type from dba_objects where status='INVALID' group by object_type;

SQL> Select count(*) from dba_objects where status='INVALID';
```
For more information

HP CloudSystem Matrix Home page [www.hp.com/go/matrix](http://www.hp.com/go/matrix)
HP ProLiant Servers [www.hp.com/go/proliant](http://www.hp.com/go/proliant)
Oracle E-Business Suite Maintenance Procedures Part # E13675-02
Oracle E-Business Suite Maintenance Utilities Part # E13676-02
Oracle E-Business Suite Patching Procedures Part # E12148-02
Oracle E-Business Suite System Administrator’s Guide – Configuration Part # E12893-02
Oracle E-Business Suite System Administrator’s Guide – Maintenance Part # E12894-02
Oracle E-Business Suite Concepts R12.1.1 Part # E12841-02
Upgrading Oracle Applications Release 11i (11.5.10.2), Part # B19297-01
Oracle Database Installation Guide 11g Release 2 (11.2) for Oracle Solaris Part # E24346-01
Oracle Database Installation Guide 11g Release 2 (11.2) for Linux Part # E24321-03
Oracle Database Upgrade Guide 11g Release 2 (11.2) Part # E23633-02